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AMERICAN PUBLISHER'S NOTICE.

THIS work, although based upon Chambers's Encyclopædia, whose distinguished merit is widely known, differs from it in important respects. It could scarcely be expected that an Encyclopædia, edited and published for a foreign market, would give as much prominence to American topics as American readers might desire. To supply these and other deficiencies the American Editors have inserted about 15,000 titles, arranging the whole, including Chambers's Supplement, in a single alphabet. The total number of titles is now about 40,000. The additions give greater fullness in the departments of biography, geography, history, natural history, and general and applied science. Scrupulous care has been taken not to mutilate or modify the original text of the edition of 1880; no changes have been made except such verbal alterations as are required by the omission of the wood-cuts. The titles of articles from Chambers's Encyclopædia, either from the main work or from the Supplement, are printed in bold-faced type—**AMERICA.** The titles of the American additions, whether of new topics or of enlargements of the old, are printed in plain capitals—AMERICA. Should it appear that an article from the English work and its American continuation disagree in any points, the reader will readily refer the conflicting statements to their proper sources.

The labor of consultation will be much reduced by the catch-words in bold-faced type at the top of the page, being the first and last titles of the pages which face each other; and by the full title-words on the back of the volume, being the first and last titles contained therein.

The word *ante* refers to Chambers's Encyclopædia, as represented in this issue. Whenever the word (*ante*) follows a title in the American additions, it indicates that the article is an enlargement of one under the same title in Chambers's Encyclopædia—usually to be found immediately preceding.

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AUDIPHONE, an instrument to assist the hearing. A thin rectangular sheet of substance resembling ebonite, provided with a handle, and having the semblance of a fan. When used as an A., the sheet is strained into a curve by strings which lead from the outer edge to the base of the handle. The outer edge is then placed against the upper teeth, and the sound-vibrations, gathered at the surface of the A., are communicated to the auditory nerve through the teeth and bones of the head. The A. may be used with artificial teeth, if they are well seated on the upper jaw.

AUDITOR (Lat. *audio*, I hear), the name given to certain officers appointed to examine accounts in behalf either of the government, of courts at law, of corporations, or of private persons. The term doubtless owes its origin to the old practice of delivering accounts *viva voce*.—AUDIT-OFFICE. In 1785, public auditors were appointed, under the title of "Commissioners for Auditing the Public Accounts," by 25 Geo. III. c. 52, by which the patents of lord Sondes and lord Mountstuart, as *auditors of the imprests*, were vacated, the sum of £7000 per annum being made payable to each of them for life, in lieu of a percentage which had been paid them on the amount of expenditure audited. Many subsequent statutes have been passed for the purpose of extending and defining the duties of these commissioners, and regulating the business of the audit-office. The commissioners of audit are empowered to call on all public accountants to account for moneys or stores intrusted to them; and, should they fail to do so, are required to certify their names to the remembrancer of the exchequer, and the attorney-general of England or Ireland, or the lord advocate of Scotland, in order that they may be proceeded against as defaulters. These proceedings, however, may be stayed for a time by the lords of the treasury, by whom the whole arrangements of the audit-office are controlled, on the application of the accused. The accounts of the ordnance, of the army and navy, and the land revenue, are now subjected to examination in the audit-office. By 2 Will. IV., c. 99, the powers and functions of the commissioners of public accounts in Ireland were transferred to the commissioners for Great Britain. The present establishment at the audit-office consists of a chairman, five commissioners, a secretary, and a large number of inspectors and examiners. The patronage is in the lords of the treasury.—AUDITOR OF THE COURT OF SESSION, in Scotland, is an officer whose duties consist in taxing the costs of suits in which expenses are found due, a remit being made to him for that purpose, either by a division of the court or a lord ordinary. The auditor returns a report to the judge or court making the remit, by whom decree is pronounced for the amount of the taxed account. Objections to the auditor's report may be stated to the judge or court. The nomination of the auditor is in the crown, the office being held *ad vitam aut culpam*. In the inferior courts an officer with corresponding powers is usually appointed by the court in which he officiates. The office of auditor of the court of session corresponds in many respects to that of the taxing-masters in the court of chancery. In Germany the name auditor is applied to junior legal functionaries.

AUDITOR (*ante*). The federal, state, and city governments elect or appoint auditors to supervise accounts. In the United States treasury department there are six, each having charge of a single branch of service. States and cities usually have one or more. An A. may be appointed by a court to state items and balances of accounts which are in question; he has authority to hear testimony, and in some states his reports are final as to questions of fact. Churches, benevolent, and other societies, usually have A.'s for inspection of financial accounts.

AUDITORY NERVE. By anatomists, the A. N. is associated with the facial, and is the seventh in order of origin from the brain, counting from before backwards. The seventh pair consists of the portio dura or facial, the portio mollis or auditory, and a small intermediate portion. The portio mollis apparently commences by some white streaks in the floor of the fourth ventricle; it then runs forward to the back of the petrous portion of the temporal bone, and enters the internal auditory meatus. The facial then leaves it to pass along the canal called the aqueductus fallopii, and the auditory divides into two portions, which diverge—the smaller one posterior for the semicircular canals and the vestibule, the other for the cochlea. Those entering the semicircular canals

divide into five branches, forming at last a nervous expansion somewhat analogous to the retina.

Several theories have been held at different periods with regard to the manner in which the nerves terminate in the cochlea, and how sound is transmitted from the latter to the brain. The latest, and that which is at present entertained by most physiologists, is that of M. Schultze. It has been shown, by actual experiment, that when a nerve in connection with a muscle is acted upon by a succession of very rapid strokes from the little hammer of a tetanmotor, and, when the strokes have arrived at a certain number in the second, a stimulus is sent along the nerve exciting the muscle to action. It is in the same way that M. Schultze supposes the impression of sound to be propagated to the nerves of the cochlea, by means of a series of little tetanmotors called the teeth of Corti, who discovered them. They are situated in the spiral lamina, which separates the spiral canal in the interior of the cochlea into an upper and a lower half or scala. The spiral lamina consists of an osseous septum, next to the central axis of the cochlea, and of a membranous layer, which prolongs the osseous septum to the outer wall of the cochlea, thus completing the spiral lamina. This membranous septum is double, and between its layers there is a chamber which contains the teeth of Corti, ranged side by side throughout the whole length of the spiral lamina, and gradually getting shorter from base to apex, like the strings of a harp or pianoforte. The chamber is filled up by a tremulous jelly-like fluid. The diagram, fig. 1, represents a perpendicular section of the spiral lamina. When the waves or vibrations of sound strike against the bones of the head, those bones are caused to vibrate; this vibration is transmitted through the head to the bones of the cochlea, which in turn set in motion the tremulous jelly which fills up the membranous chamber, *c*.

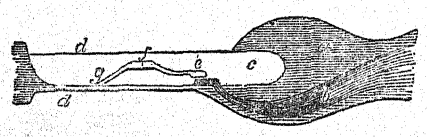


Fig. 1.

a, the osseous septum grooved for the passage of the cochlear nerve *b*, which terminates by a free end inside the chamber *c*, along the floor of which it lies for a short distance; *d*, *d*, are the two layers of the membranous septum. Lying in contact with the end of the nerve is the enlarged extremity of a rod *e*, which is connected in a flail-like manner by the hinge *f* to another rod, which is fixed at *g*.

AUDLEY, Sir JAMES, one of the original knights of the order of the Garter, founded in 1344 by Edward III., on his return from France after the victory of Cressy, was frequently in personal attendance on Edward the Black Prince, whom he accompanied to France in 1346. He was so conspicuously brave at the battle of Poictiers that the prince retained him as his own knight, and declared him to be the bravest soldier on his side. He conferred on him an annual revenue of 500 marks, which A. immediately gave up to his squires. This act of disinterestedness becoming known, the Black Prince conferred a further annual sum of 600 marks upon him. A. also accompanied the Black Prince into Spain, and in 1369 the office of seneschal of Poitou was conferred upon him. He took part in the capture of La-Roche-sur-Yon in Poitou, in the same year, and d. a few months after. The prince attended his funeral obsequies at Poictiers.

AUDLEY, THOMAS, lord Audley of Waldon, 1488–1544; an English lord chancellor. He was chosen speaker of the commons in the Long parliament in 1529; in 1532, he was made a knight and successor of Sir Thomas More as keeper of the great seal. In 1533, Henry VIII. made him lord chancellor, in which capacity he presided at the trial of More and others. When the confiscated church lands were parceled out, A. got Christ church in London with all its real estate, together with the great abbey of Walden, in Essex, which he made into a residence for himself. He gave lands to the support of what was then Buckingham college, Oxford, which was incorporated after the gift under the name of St. Mary Magdalen's college.

AUDOUIN, JEAN VICTOR, 1797–1841; an entomologist, native of Paris. With Dumas and Brongniart, in 1824, he began the *Annals of Natural Science*. He was professor of entomology in the museum, and a physician, in 1826. He was the founder and first president of the entomological society, and in 1838 a member of the academy. He investigated, at the request of the government, the injuries done to vine and silk culture by insects, and contributed a great number of reports and papers on his favorite subject, and, with others, wrote a work on the insects injurious to vineyards, etc.

AUDRAIN', a co. in n.e. Missouri, intersected by the St. Louis, Kansas City and Northern, and a branch of the Chicago and Alton railroads; 675 sq.m.; pop. '80. 19,760 It is a grazing and agricultural region, generally level and fertile. Beds of coal have been found. Co. seat, Mexico.

AUDRAN, GÉRARD, one of the most celebrated engravers of the French school, was b. at Lyon in 1640. He belonged to a family distinguished for its excellence in this department of art. After a three years' residence at Rome, where he studied under Carlo Maratti, and acquired a high reputation by his engraving of pope Clement IX., he was recalled to France by Colbert, and was appointed engraver to his majesty Louis XIV. Here he engraved the principal works of Lebrun, with whom he lived on terms of the closest friendship. His masterpieces are a series of engravings illustrating the battles of Alexander. He d. at Paris, 1703.

AU'DUBON, a co. in s.w. Iowa; 630 sq.m.; pop. '75, 2370. Agriculture is the leading interest. Co. seat, Exira.

AU'DUBON, JOHN JAMES, a distinguished American ornithologist, was b. in Louisiana, United States, in May, 1780, where his parents, who were both French, had settled on a plantation. His father, who was himself an ardent lover of nature, early directed his son's attention to natural objects. The youth conceived a passion for the study of birds; and a book of ornithological specimens determined him to become a draughtsman. About the age of 14, he went to Paris, and studied for some time under the celebrated David. In 1798, he was settled on a farm in Pennsylvania by his father, but he did not distinguish himself as an agriculturist. In 1810 he sailed down the Ohio with his wife and child, on a bird-sketching expedition. The following year, he visited Florida for a like purpose; and for many years after he continued his ornithological researches among the American woods; to the neglect of his ordinary business. The latter he finally abandoned; and in 1824 he went to Philadelphia, where he was introduced to prince Charles Lucien Bonaparte, who so warmly encouraged him in his plans that he determined on publication. After two years' further exploration of the forests of his native country, he came to Europe with the view to secure subscribers for his work on *The Birds of America*. He met with a warm reception from such men as Herschel, Cuvier, Humboldt, Brewster, Wilson, and Sir Walter Scott. The issue of his work was commenced shortly after, each bird being delineated life-size. The colored engravings were chiefly executed by the late Mr. W. H. Lizars of Edinburgh. The work was completed in 87 parts, elephant folio, containing 448 plates. While the work was in process of publication in this country (it was finished in 1839), A. revisited America three times, in order to make further researches. In 1831, he began the publication of his *American Ornithological Biography* in Edinburgh, which was also completed in 1839. In 1839, A. finally returned to America, where, in 1844, he published a reduced edition of his works. Assisted by Dr. Buchanan, he also published *The Quadrupeds of America*, and a *Biography of American Quadrupeds*. He d. Jan. 27, 1851, in his 71st year.

AUENBRUG'GER, or AVENBRUG'GER, VON AU'ENBRUG, LEOPOLD, 1722–1809; an Austrian physician who discovered the mode of investigating diseases of the chest and abdomen by auscultation. He applied his ear to the chest, and noted the sounds that followed a smart blow of his hand on the patient. His treatise on the subject attracted little attention until it was translated and illustrated by Corvisant, in 1808, when it quickly led the way to Laennec's improvement, whereby the ear is aided by the stethoscope. The great value of A.'s discovery has long been universally admitted.

AU'ER, ALOIS, was b. May 11, 1813, at Wels, in upper Austria, and was trained in a printing establishment of his native town to be a compositor, corrector, and manager. During his scanty leisure moments, A. employed himself in acquiring a knowledge of French, Italian, English, and other languages, in which he underwent an examination in 1835 and 1836, before the university of Vienna. His brilliant appearance on this occasion opened up to his ambition the probability of a professorial chair. In Oct., 1837, he was appointed professor of Italian in the college of Linz, in upper Austria. Here he labored assiduously in public and private teaching, and published a variety of useful school-books, on a system peculiar to himself. In 1839 he set out on his travels through Germany, Switzerland, France, and England, collecting materials for his favorite art. From 1841 to 1868, he was director of the national printing-office at Vienna. In 1847 he was elected member of the academy of sciences. He made known a photographic discovery, "spontaneous impression," in *Die Entdeckung des Naturselbstdrucker* (1864). He d. in 1869. A. published the *Sprachalle, or Lord's Prayer, in* 603 *languages*, with Roman types (1844); and the *Lord's Prayer in* 200 *languages*, with their national alphabets (1847). See NATURE-PRINTING.

AU'ERBACH, BERTHOLD, a popular German author, of Jewish extraction, was b. at Nordstetten, in the Würtemberg Black Forest, Feb. 28, 1812. He received his education at Carlsruhe, Stuttgart, Tübingen, Munich, and Heidelberg. Having at an early period abandoned the study of Jewish theology, he devoted his attention to literature. His first publications, *Judaism and Modern Literature* (Stuttg. 1836), and a translation of the works of Spinoza, with a critical life of his author (5 vols. Stuttg. 1841), had a philosophical tendency. In his *Educated Citizen* (Carlsruhe, 1842), and *Village Tales of the Black Forest* (1843), he applied himself to the portraiture of real life, and succeeded well. The *Village Tales* were translated into English, Swedish, and Dutch, and were generally admired. Among his other works are *Schrift und Volk* (1846); *Das Landhaus am Rhein* (1869); *Wieder unser; Gedenkblätter zur Geschichte dieser Tage* (1871); *Waldfried* (1874), etc.

AU'ERBACH, HEINRICH (real name STROMER), 1482–1543; a Bavarian physician and friend of Luther. He erected a large building in Leipsic in 1530 which is still known as the Auerbachshof, in which is a cellar where the great reformer drank, and out of which, as the people believed, Faust, the magician, rode upon a barrel, an event kept in memory by a painting on the wall of the cellar.

AU'ERSPERG, ADOLPH WILHELM DANIEL, Prince, b. 1821; son of prince Wilhelm Auersperg; served as a major of dragoons; in 1867, a member of the Bohemian diet, and

president of the assembly; in 1869, member of the upper chamber of the Austrian Reichstag; in 1871, succeeded Benet as the head of the Austrian ministry. He was in the same office in 1879.

AU'ERSPERG, ANTON ALEXANDER, Count von, 1806–76; an Austrian statesman and poet, more widely known by the *nom de plume* "Anastasius Grun." He belonged to an old Suabian family which obtained large estates in Carniola. After studying law and philosophy in Vienna and Gratz he traveled over Europe and England, and in 1829 married the countess Maria von Attems. He was offered official position but refused, as he was a prominent liberal and a strong opponent of Metternich and his policy. He wrote verses while a student, and in 1830 published a small volume, and also a semi-political romance. The next year his political reviews appeared and made a great sensation, exciting the government to detect the writer, who was fined 50 ducats. In 1835, he issued another collection of patriotic verses, and in 1837 collected his earlier writings into one volume, of which nearly 20 editions have been published. In 1848, he was chosen to the German "Vorparliament," and soon afterwards to the Frankfort national assembly, where he was on the "left center." He left in disgust before the year ended, in consequence of the murders of Auerswald and Lychnowski. In 1859, he returned to public life, but in 1861 was made a life-member of the Austrian Hevrenhaus, where he was the author of addresses to the throne. In the diet of Carniola and Styria he was a liberal and the supporter of German ideas. In 1868, he was elected president of the delegates of the Austrian crown lands, but, except the seat in the Hevrenhaus, he resigned all official positions. Some of his speeches, especially those in the confessional debates of 1868 and 1874, have attained great popularity. *Robin Hood* (in German) was his last poetical work of consequence.

AU'ERSPERG, CARLOS, Prince, b. 1814; an Austrian statesman, member of one of the oldest families of the empire. On the re-establishment of constitutional government, in 1861, he was made president of the upper chamber of the Reichsrath; and as representative of the Bohemian landed nobility in the diet of Prague, he has taken a conspicuous part in the defense of the constitutional system against clerical and feudal reaction, and in establishing the unity of the empire against federation. He was a zealous supporter of the liberal cabinet, at the head of which was his brother Adolph.

AU'ERSTÄDT, a village in Saxony, 10 m. w. of Naumburg, where Davoust won a great victory over the Prussians under the duke of Brunswick on the day (Oct. 14, 1806) that Napoleon defeated their main army at Jena. Napoleon made Davoust duke of A.

AU'GEAS, or AU'GEIAS, according to one account, the son of Helios and Iphiboe, but according to others, of Phorbas and Hermione, was king of Elis, and renowned for his wealth in oxen, of which he fed 3000 head in his stables. When the dung of these animals had been allowed to accumulate for many years, Hercules was commissioned by Eurystheus to cleanse the Augean stables in one day, and was promised as payment a tenth part of the oxen. Hercules accomplished the task by turning the courses of the rivers Peneus and Alpheus through the masses of ordure. When A. refused to pay the stipulated wages, a war ensued, and A. was slain by Hercules. The fable of the Augean stables often serves as an allusion in declamations on political corruptions, etc.

AUGEREAU, PIERRE FRANÇOIS CHARLES, duke of Castiglione, marshal and peer of France, one of the most brilliant and intrepid of that band of general officers whom Napoleon gathered around himself, was the son of a tradesman, and was b. 21st Oct., 1757. After serving some time in the French carabineers, into which he enlisted at the age of 17, he entered the Neapolitan service, in which he remained until 1787, when he settled in Naples as a fencing-master. With other French residents, he was banished from that city in 1792, and immediately volunteered into the French revolutionary army intended for the repulsion of the Spaniards. His services were so conspicuous, that in less than three years he was made general of a division. In 1795 he accompanied the army to Italy, where he greatly distinguished himself, especially in the field, but also in the council. He took an active part and gained much glory in the battles of Millesimo, Ceva, Lodi, Castiglione (for which he received his title), Roveredo, Bassano, etc. In 1797, he was appointed to the command of the army of the Rhine; but in a few months after, the directory not liking the spirit he displayed there, made him commander of the 10th division at Perpignan. This post he resigned in 1799, when he was elected as deputy into the council of the five hundred. In 1801 he received the command of the army in Holland, and was active in several engagements. In 1804 he was made a marshal; and in the following year he commanded a division of the army which reduced the Vorarlberg; and was afterwards engaged at Wetzlar, Jena, Eylau; also in Italy (1809); Spain (1810); Berlin, Bavaria, and Saxony (1813). He d. June 11, 1816.

AUGER, FLEXIBLE, an invention which permits great freedom in the direction of a boring tool. Its shaft is a closely coiled, flexible, steel spiral, fitted at one end with a sheave or pulley, and at the other with a suitable jaw for holding a bit. This shaft turns within a flexible tube, lined with spiral wire. Motion is communicated to the pulley by a cord, or belt, from some fixed machinery, and the belt is kept strained by a

counter-rope which is tied to some firm support. Augers are used varying from three eighths of an inch to an inch in diameter. The larger requires an inch driving cord.

AUGIER, GUILLAUME VICTOR ÉMILE, a French dramatist of considerable reputation, was b. at Valence, on the 17th of Sept., 1820, and was educated for the profession of an advocate. He soon, however, showed a predilection for letters, especially the drama. In 1844, he composed a piece in two acts, and in verse, entitled *La Ciguë*, which he offered to the Théâtre Français, but without success. The Odéon, however, received it, and it was played at that theater with considerable applause for nearly three months. This, while it is the first, is said to be likewise the best of A.'s works, containing some excellent moral lessons, set in a frame-work of the antique, and made attractive by elegant versification. In the following year, the Théâtre Français sought his services, and he produced for that theater his second comedy, entitled *Un Homme de Bien*, in three acts, and in verse. This was a comedy of the day, and was only partially successful. A third, *L'Aventurière*, which appeared in 1848, was better received; still there was said to be too much of commonplace in the moral sentiments with which it abounded. *Gabrielle*, in five acts, and in verse, which appeared in 1849, was also a highly moral piece, and gained for its author the Monthyon prize. In 1852, A. wrote a drama, entitled *Diane*, in which Rachel took the principal part, but in spite of all her efforts it proved a failure. He was more fortunate with *La Pierre de Touche*, a prose comedy in five acts, written in partnership with Jules Sandeau, and produced in 1853. In the same year he wrote a verse-comedy, in three acts, entitled *Philiberte*, said to be a charming *genre* piece, in which the grace of the details supplies the absence of intrigue. His subsequent pieces, however, belong all more or less to the comedy of intrigue. Such are *Le Mariage d'Olympe; Le Gendre de M. Poirier*, written in partnership with Jules Sandeau; and *La Revanche de Georges Dandin*—all produced in 1855; *La Jeunesse*, in 1858; *Les Lionnes Pauvres*, in the same year, written in conjunction with E. Foussier; and the *Beau Mariage*, also in conjunction with Foussier, in 1859. Either singly or with others, M. A. has also written *Les Effrontés, Le Fils de Giboyer, Maître Guérin, La Contagion, La Chasse au Roman, L'Habit Vert, Paul Forestier*, and *Sapho*—the last mentioned an opera, the music by Gounod. In 1856, he published a small volume of *Poésies*, some of which are very elegant both in thought and expression. Usually, A. is regarded as one of the leaders of the school of good sense; in his later pieces, however, approaching too much to the manner of the younger Dumas. In 1858, M. A. was elected a member of the Académie Française, and in the same year was promoted to the rank of officer in the *légion d'honneur*, of which he became a commander in 1868.

AU'GITE (from Gr. *augé*, brilliancy), or PY'ROXENE (from Gr. *pyr*, fire, and *xenos*, a guest), a mineral very nearly allied to hornblende (q.v.), which has, indeed, by some mineralogists been regarded as a variety of it, although the distinction between them is undeniably important, as characterizing two distinct series of igneous rocks. A. consists of 47 to 56 per cent of silica, 20 to 25 per cent of lime, and 12 to 19 per cent of magnesia, the magnesia sometimes giving place in whole or in part to protoxide of iron, and some varieties containing a little alumina, or a little protoxide of manganese. Its specific gravity is 3.195 to 3.525. It is little affected by acids, or not at all. It is usually of a greenish color, often nearly black. It crystallizes in six or eight-sided prisms variously modified; it often occurs in crystals, sometimes imbedded, often in grains or scales. It is an essential component of many igneous rocks, particularly of basalt (q.v.), dolerite, and A. porphyry (see PORPHYRY), from which chiefly it derives its importance as a mineral species. A. rock, consisting essentially of A. alone, occurs in the Pyrenees. A. is a common mineral in the trap-rocks of Britain and other countries. It is rarely associated with quartz, in which respect it differs from hornblende, but very often with labradorite, olivine, and leucite. Fluorine, which is generally present in small quantity in hornblende, has never been detected in A. The form of the crystals is also different in the two minerals, as well as their cleavage; but prof. Gustav Rose of Berlin has endeavored to show that the difference between A. and hornblende arises only from the different circumstances in which crystallization has taken place, and that A. is the production of a comparatively rapid, and hornblende of a comparatively slow cooling. He regards some of the varieties as intermediate. His views have been supported by experiments, and by a comparison of A. with certain crystalline substances occurring among the scoriæ of foundries.—*Diopside, sahlite*, and *coccolite* are varieties of A.—*Diallage* (q.v.) and *hypersthene* (q.v.) are very nearly allied to it.

AU'GLAIZE, a co. in w. Ohio, intersected by the Dayton and Michigan and the Lake Erie and Louisville railroads; 399 sq.m.; pop. '80, 25,443. The Miami canal passes through, and it is drained by A. river. Surface level, well wooded, and soil fertile. Co. seat, Wapakoneta.

AUGMENTATION, in heraldry. See HERALDRY.

AUGMENTATION, in music, is the reproduction of a melody, or principal subject of a composition, in the course of the progress of the piece, in notes of greater length than those notes in which the melody is first introduced. The tempo remains unaltered. A. is of great importance in the treatment of the subjects, or themes, for fugues, and, when cleverly used, produces great effects.

AUGMENTATION, PROCESS OF, in Scotch law, is an action in the court of teinds (q.v.) by the minister of a parish against the titular, or beneficiary, and heritors, for the purpose of procuring an increase to his stipend. The moderator and clerk of the presbytery to which the minister belongs must also be called as parties. By 48 Geo. III. c. 138, it is enacted that no A. shall be granted till the expiration of 15 years from any A. previous to the act, nor till the expiration of 20 years from any A. subsequent to the act. A period of 20 years must thus elapse between each augmentation. The amount of the A. is fixed, or modified, as it is termed, in grain or victual; the stipend itself being paid in money, according to the fiars' prices (q.v.) of each year. In addition to the ascertainment or modification of a suitable stipend, regard being had to the state of the teinds, the extent of the parish, the expense of living, and the like—a process of A. has the further object in view of *locating* the stipend so modified—i.e., of assigning it in due proportions to the heritors or other parties in possession of the tithes. This latter object is attended by means of what is called a scheme of locality—i.e., an allotment of the stipend modified to the several parties liable therefor. This scheme is prepared at the instance of the second junior lord ordinary (q.v.), on a remit from the teind court. The last conclusion in a summons of A. is for a suitable sum, or increase to the sum already allowed, for communion elements—i.e., for bread, wine, and other necessaries for celebrating the sacrament of the Lord's supper after the Presbyterian fashion. When there is not a sufficient amount of teind to bring the stipend of the minister up to £150 per annum, with £8 6s. 8*d.* for communion elements, it is provided by 50 Geo. III. c. 84, and 5 Geo. IV. c. 72, that the residue shall be paid by the exchequer. In addition to their stipend, ministers have right to a manse and glebe, or a provision of £50 annually in lieu of them. See STIPEND, GLEBE, MANSE; see also PARLIAMENTARY CHURCH.

AUGS'BURG, historically one of the most notable cities in Germany, is situated in the angle between the rivers Wertach and Lech, and is the chief city of the circle of Swabia and Neuburg, in Bavaria. The pop. is (1875) 57,210. Though presenting an antique and rather deserted appearance, A. has numerous fine buildings, and especially one noble street, the "imperial" Maximilian Strasse, adorned with bronze fountains. The industry of A. is reviving; several cotton and woolen factories are in operation, as well as manufactories of paper, tobacco, and machinery. Its gold and silver wares still retain their ancient reputation. The art of copper engraving is extinct; but printing, lithography, and bookselling have taken a new start. The *Allgemeine Zeitung*, the most widely circulated paper in Germany, is published here. In 1870, there were 10 printing establishments and 34 book-shops. There are 74 breweries. Banking and stock-jobbing are extensively carried on; and it is still the emporium of the trade with Italy and southern Germany. It is the center of a system of railways connecting it with Nürnberg and Leipsic, with Switzerland, Munich, etc. The foundation of A. was the "colony" planted by the emperor Augustus, 12 B.C., after the conquest of the Vindelici, probably on the site of a former residence of that people. It was called *Augusta Vindelicorum*, and hence the present name. It became the capital of the province of Rhætia, was laid waste by the Huns in the 5th c., and came next under the dominion of the Frankish kings. In the war of Charlemagne with Thassilo of Bavaria, it was again destroyed. After the division of Charlemagne's empire, it came under the duke of Swabia; but having become already rich by commerce, was able to purchase gradually many privileges, and finally became, in 1276, a free city of the empire. It now rose to greater consequence than ever, and had reached the summit of its prosperity by the end of the 14th century. About this time (1368), its aristocratic government was set aside for a democratic, which lasted for 170 years, till the aristocracy, favored by Charles V., regained the ascendency. A. continued in great eminence for its commerce, manufactures, and art, till the war between Charles V. and the Protestant league of Schmalkald (1540). Along with Nürnberg it formed the emporium of the trade between northern Europe and the south, and its merchants were princes whose ships were in all seas. See FUGGER. It was also the center of German art as represented by the Holbeins, Burkmair, Altdorfer, and others. Many diets of the empire were held in A., and the leading events of the reformation are associated with its name. The discovery of the road to India by the cape, and of America, turned the commerce of the world into new channels, and dried up the sources of A.'s prosperity. It lost its freedom with the abolition of the German empire in 1806, and was taken possession of by Bavaria.

AUGS'BURG CONFESSION, the chief standard of faith in the Lutheran church. Its history is the following. With a view to an amicable arrangement of the religious split that had existed in Germany since 1517, Charles V., as protector of the church, had convoked a diet of the empire, to meet at Augsburg, 8th April, 1530, and had required from the Protestants a short statement of the doctrines in which they departed from the Catholic church. The elector, John, of Saxony, therefore, in Mar., called on his Wittenberg theologians, with Luther at their head, to draw up articles of faith, to lay before him at Torgau. The commissioned doctors took as a basis, in so far as pure doctrine was concerned, articles that had been agreed to the previous year at conferences held at Marburg and Schwabach, in the form of resolutions of the Lutheran reformers of Germany against the doctrines of Zwingli. These doctrinal articles supplemented, and with a practical part newly added, were laid before the elector at Torgau. Mel-

anchthon then, taking the Torgau articles as a foundation, began in Augsburg, in May, and with the advice of various Protestant theologians, as well as princes and other secular authorities, composed the document, which he first called an apology, but which in the diet itself took the name of the A. C. Luther was not present in Augsburg, being then under the ban of the empire, but his advice was had recourse to in its composition. The Torgau articles were in German; the confession was both in German and Latin; and Melanchthon labored incessantly at its improvement till it was presented to the emperor, June 25. The character of Melanchthon, in the absence of Luther, had led him, in setting about the composition of the document, to aim at maintaining a spirit of love, forbearance, and mediation, as well as the utmost brevity and simplicity. Its object, which only became gradually apparent after the meeting of the diet, was, in the first place, to give a collected view of the belief of the Lutheran Protestants, aiming at the same time at refuting the calumnies of the Catholics, and at laying a foundation for measures of reconciliation.

The first part of the confession contains 21 articles of faith and doctrine: 1. Of God; 2. Of original sin; 3. Of the Son of God; 4. Of justification; 5. Of preaching; 6. Of new obedience; 7 and 8. Of the church; 9. Of baptism; 10. Of the Lord's supper; 11. Of confession; 12. Of penance; 13. Of the use of sacraments; 14. Of church government; 15. Of church order; 16. Of secular government; 17. Of Christ's second coming to judgment; 18. Of free will; 19. Of the cause of sin; 20. Of faith and good works; 21. Of the worship of saints. The second and more practical part, which is carried out at greater length, contains seven articles on disputed points: 22. On the two kinds of the sacrament; 23. Of the marriage of priests; 24. Of the mass; 25. Of confession; 26. Of distinctions of meat; 27. Of conventual vows; 28. Of the authority of bishops.

This document, signed by some six Protestant princes and two free cities, was read before the emperor and the diet, 25th June, 1530. Melanchthon, not looking upon the confession as binding, began shortly after to make some alterations in its expression; at last, in 1540, he published a Latin edition (*Confessio Variata*) in which there were important changes and additions. This was especially the case with the article on the Lord's supper, in which, with a view to conciliation, he endeavored to unite the views of the Lutherans and Calvinists. This gave rise subsequently to much controversy; orthodox Lutheranism repudiated the alterations of Melanchthon, and long continued to subject his memory to great abuse; though it is clear that Melanchthon and his adherents contemplated no substantial departure in doctrine from the original confession. It is not certain that the form of the confession found in the Lutheran standards is identical with the unaltered A. C., as the two original documents—German and Latin—laid before the diet have been lost. The chief distinction between the orthodox Lutherans and the reformed churches of Germany has all along been adherence to the "unaltered" or to the "altered" confession. It was even a matter of controversy whether the "reformed" were entitled to the rights secured to the Protestants by the religious peace of Augsburg, concluded in 1555, on the ground of the "unaltered" confession.—Though the A. C. is still formally adhered to by the Protestant churches of Germany, it is confessedly no longer the expression of the belief of the vast majority of the members, after the great advances made by theology, and the many alterations in public opinion and feeling.

AUGSBURG INTERIM. See INTERIM.

AUGUR, CHRISTOPHER C., b. 1821; a graduate of West Point and brigadier-general in the U. S. army; served in the war with Mexico, and in various Indian skirmishes. In the civil war he was major-general of volunteers, and was wounded at Cedar mountain. At the close of the war he was brevetted major-general of the regular army.

AUGUR, HEZEKIAH, 1791–1858; an American artist. His best work is the statue of "Jephtha and his Daughter" in the Trumbull gallery of Yale college: but what gave him greater fame was the invention of a machine for carving, which is now in general use.

AUGURIES and **AUSPICES.** These terms are familiar to every reader of Roman history, and are, besides, so frequently employed in English in a secondary and metaphorical sense, that a vague notion of their original meaning is caught up even by those who know nothing of classical antiquities. As, however, the entire religious and political life of the early Romans was deeply penetrated by the influence of their sacred superstitions, and as amongst these auguries and auspices held a prominent place, a clear conception of what they were is a matter of considerable moment. The following statements exhibit, in a condensed form, the substance of what is known on the subject.

Like almost all primitive nations, the Romans believed that every unusual occurrence had a supernatural significance, and contained, hidden in it, the will of heaven regarding men. To reveal or interpret this hidden will, was the exclusive privilege of the augur, who apparently derived his official designation, in part at least, from *avis*, a bird; while Roman history abundantly proves that the observation of the flight of birds was a principal means adopted for discovering the purpose of the gods. It was not, however, any one who could be appointed an augur. The gods selected their own interpreters—that is to say, they conferred the divine gift upon them from their very birth; but an educational discipline was also considered necessary, and hence a "college of

augurs" figures in the very dawn of Roman history. Romulus, it is almost certain, was an augur himself. He is said to have been skilled in the art of divination from his youth; and by "divination" we must specially understand augury; for the Romans, with patriotic piety, held all the forms of divination practiced in other countries to be useless and profane. Previous to the Ogulnian law, passed in the year 307 B.C., there were only four augurs, who were selected from the patricians. By this law, however, the plebeians became eligible for the pontifical or augural offices, and five were immediately created. For more than 200 years, the number continued the same, till Sulla, in 81 B.C., increased it to fifteen. Finally, in the first days of the empire, when all parties, sick of the long civil wars, hurried to throw their privileges at the feet of the monarch who had brought peace into their homes, the right of electing augurs at his pleasure was conferred on Augustus, after which the number became indefinite.

At first the augurs were elected by the *comitia curiata;* but as the sanction of the former was necessary to give validity to the acts of the latter, they could always "veto" any elections which were obnoxious to them; so that the power of electing members to fill up vacancies naturally fell into the hands of the college itself, and so continued till 103 B.C., when a tribune of the people named Ahenobarbus carried a law by which it was enacted that for the future, vacancies in the augural and pontifical offices should not be filled up by those religious corporations themselves, but by a majority of certain picked tribes. This new law was occasionally repealed and re-enacted during the civil wars which lasted till the time of Augustus. The scramble for power, however, during these political vicissitudes, as well as the general advance of knowledge, had rendered its prophetic pretensions ridiculous in the eyes of educated people. By Cicero's time, it had lost its religious character altogether, but was still regarded as one of the highest political dignities, and coveted for the power it conferred.

The modes of divination employed by the augurs were five in number—*augurium ex cœlo, ex avibus, ex tripudiis, ex quadrupedibus, ex diris.* The *first,* related to the interpretation of the celestial phenomena, such as thunder and lightning, was apparently of Etruscan origin, and held to be of supreme significance. The *second* related to the interpretation of the noise and flight of birds. It was not every bird, however, that could be a sure messenger of the gods. Generally speaking, those "consulted," as it was called, were the eagle, vulture, crow, raven, owl, and hen. The first two belonged to the class of *alites,* or birds whose *flight* revealed the will of the gods; the last four to the class of *oscines,* whose voice divulged the same. These two modes of augury were the oldest and most important. Of the other three, the auguries *ex tripudiis* were taken from the feeding of chickens; the auguries *ex quadrupedibus,* from four-footed animals —as, for instance, if a dog, or wolf, or hare ran across the path of a Roman, and startled him by any unusual motion, he mentioned it to an augur, who was expected to be able to advise him what to do; the auguries *ex diris* (a vague kind of augury), from any trifling accidents or occurrences not included in the previous four—such as sneezing, stumbling, spilling salt on the table, etc.

At Rome, the auspices were taken on the summit of the Capitoline hill; and the ground on which the augur stood was solemnly set apart for the purpose. The latter then took a wand, and marked out a portion of the heavens in which his observations were to be made. This imaginary portion was called a *templum* (hence *contemplari,* to contemplate), and was subdivided into right and left. According as the birds appeared in either of these divisions were the auspices favorable or unfavorable. How vast the political influence and authority of the augurs must have been is seen from the fact that almost nothing of any consequence could take place without their sanction and approval. The election of every important ruler, king, consul, dictator, or prætor, every civic officer, every religious functionary, was invalid if the auspices were unfavorable. No general could lawfully engage in battle—no public land could be allotted—no marriage or adoption, at least among the patricians, was held valid—unless the auspices were first taken, while the comitia of the centuries could be dispersed at a moment's notice by the veto of any member of the augural college.

We have employed the two terms, auguries and auspices, as synonymous. But a slight difference is perceptible between them: not the augurs only, but the chief magistrates of Rome (inheriting the honor from Romulus), held the "auspices," while the "auguries" were exclusively in the possession of the former; but the mode of divination, and the end to be obtained by it, seem to have been the same in both cases.

The power of taking the auspices in war was confined to the commander-in-chief; and any victory gained by a legate was said to be won under the auspices of his superior, and the latter alone was entitled to a triumph. Hence has originated the very common phrase in our language, "under the auspices" of some one, which usually denotes nothing more than that the person alluded to merely lends the influence of his name.

AUGUST, the sixth month in the Roman year, which began with Mar. was originally styled *Sextilis,* and received its present name from the emperor Augustus, on account of several of the most fortunate events of his life having occurred during this month. On this month he was first admitted to the consulate, and thrice entered the city in triumph. On the same month, the legions from the Janiculum placed themselves under his auspices, Egypt was brought under the authority of the Roman people, and an end put to the civil wars. (See Macrobius, i. 12.) As the fifth month, or *Quintilis,* had pre-

viously been styled Julius in honor of Julius Cæsar, a day was taken from Feb. to make A. equal with July.

AUGUSTA, the name of two considerable cities in the United States.—1. A. is the capital of Maine, situated on both banks of the river Kennebec, which is here crossed by a bridge 520 ft. long. Its lat. is 44° 19′ n., and long. 69° 50′ w. Up to A. the river is navigable for sloops from its mouth, a distance of 43 m., in a straight line; while a dam, constructed immediately above the city, enables steamboats to ply more than 20 m. above, as far as Waterville. A. is also a station on the railway between Portland and Bangor. The dam, too, which improves the navigation, has created a vast water-power, which is extensively employed for manufacturing purposes. Between 1830 and 1870, the pop. had increased from 3980 to 7808.—2. A. is the second city in Georgia, on the Savannah, 231 m. from its mouth. Its lat. is 33° 28′ n., and long. 81° 54′ w. It has extensive railway communication; and a canal, from a point 9 m. up, brings the waters of the Savannah to the city on such a level as to furnish a fall of 35 or 40 ft.—a water-power which is extensively and profitably employed. It is spacious and regular in its plan—Greene street, for instance, being 168 ft. broad. The chief buildings are the city hall, a masonic hall, an odd-fellows' hall, the Richmond academy, the Georgia medical college, the opera-house, and an orphan asylum. The city also possesses an arsenal, water-works, and numerous banks, factories—of which the chief is "Augusta factory," with 500 hands—foundries, flouring-mills, churches, hospitals, and newspapers. Of late years, the pop. has increased rapidly. In 1880, it was 22,301.

AUGUSTA, a co. of Virginia, in the valley of the Shenandoah; 900 sq.m.; pop. '70, 28,763—6737 colored; in '80, 35,500—7000 colored. It is watered by the branches of the Shenandoah and their tributaries, and by several small streams flowing into the James river. The elevation is considerable, including as it does the ridge dividing the waters of the Shenandoah from those of the James. The population is largely of Scotch-Irish descent, with an intermixture of the German element from Pennsylvania. The chief productions are beef, pork, mutton, wool, wheat, corn, rye, oats, barley, hay, and tobacco. The streams furnish an abundance of water power. Deposits of iron and magnesia are found in some places. Near Craigsville is an inexhaustible deposit of coral marble of fine quality, and in the eastern section anthracite coal is abundant. Mineral springs abound. The educational advantages of the county are of a superior kind.

AUGUSTA, JOHN, 1500–75; a German theologian. He studied at Würtemberg under Luther and Melanchthon, though he did not adopt all of the former's views. He was a minister among the Bohemian brethren, and subsequently the bishop of the sect. After the Schmalkalden war, all the sect were banished, and A. and other leaders arrested. He was offered freedom if he would make public recantation, but this he declined to do. In 1564 he was liberated, pledging himself not to teach or preach. He wrote an *Outline of the Doctrines of the Bohemian Brethren*, and two other religious works.

AUGUSTA, MARIA LOUISA CATHERINE, b. Sept. 30, 1811; queen of Prussia and empress of Germany, daughter of Charles Frederick, the grand duke of Saxe Weimar, by a daughter of Paul I. of Russia. She was brought up at the court of her grandfather, Charles Augustus, where she was intimate with Goethe. Her oldest sister married Charles, prince of Prussia, and she married his brother William, June 11, 1829. Her only children are the crown prince and the princess Louisa, whose education she herself personally superintended. The empress is a lover and patron of arts and letters, and is greatly beloved for benevolence, and for personal exertion for the relief of wounded soldiers in 1870–71, which work she supplemented in 1872 by founding a seminary for the education of the daughters of officers who fell in the war.

AUGUSTA HISTORIA, or AUGUSTAN HISTORY, the title of a collection of biographies of Roman emperors from Adrian to Carinuc. The memoirs are important for matters of fact, but the literary character is poor. The first edition was printed as early as 1475, at Milan. There is no English translation.

AUGUSTAN AGE, the literary period of Rome which was at its height in the reign of Augustus, during which such writers as Ovid, Horace, Cicero, Virgil, and Catullus flourished, with patrons of literature like Mecænas. At that age the language was in its perfection, and men of letters were held in high honor. The English A. A. was the period of Addison, Swift, Steele, and their compeers. In France such a period is assigned to the latter part of the reign of Louis XIV.

AUGUSTENBURG, a village of 800 inhabitants in the center of the island of Alsen. It is noted for being the residence of the duke of Holstein-Sonderburg-Augustenburg, for its splendid "stables," and for the castle belonging to the ducal family.

AUGUSTI, a learned German theologian, b. in 1772 at Eschenberga, near Gotha. He studied at Jena under the celebrated Griesbach, and afterwards devoted himself for some time to public teaching. In 1798, he became lecturer (*privat-docent*) in philosophy, and in 1800 he was appointed professor-extraordinary of the same. Three years after, he succeeded Ilgen in the chair of oriental literature; but his love of theological studies becoming predominant, he accepted the offer of a theological professorship in the university of Breslau, where he exerted a wide and beneficial influence. In 1819 he was

transferred to Bonn, and made a director of the consistory at Cologne. Other ecclesiastical honors were conferred on him during the course of his life. He d. on the 28th April, 1841.

In the early part of his career, A. was a decided rationalist; but subsequently he returned to orthodox Lutheranism, more, perhaps, from the conservative bias of his nature, than from any profound conviction of the truth of the national creed. The change, however, was not accompanied, as is usual in such cases, with any intense bigotry. A. remained to the last a liberal-hearted Christian. His writings, marked by great learning, industry, and spirit, are much esteemed by his countrymen. The most important is his *Manual of Christian Archæology* (Leip., 1836–37).

AUGUSTINE, AURELIUS ST., the greatest of the Latin fathers, was b. at Tagaste, a t. of Numidia, on the 13th of Nov., 354 A.D. His father, Patricius, was poor, but of good family, and filled the office of magistrate. He continued a pagan till advanced in years, and was only baptized shortly before his death. He does not seem to have been remarkable for any elevation of mind; on the contrary, one may fairly conclude, from his son's statements, that he was an irascible, kind-hearted man, more intent on his son's advancement in this world than in that which is to come. His temper often caused great sorrow to his gentle and pious wife, who loved him faithfully, however, and was therefore rewarded with the secret by which she could charm the evil spirit out of him. Patricius was very anxious that A. should become a fine scholar, as he noticed that not a few people in his day were obtaining large incomes by their "wits." A. was accordingly sent to school at Madaura, and subsequently to Carthage, to complete his studies. Previous to this, however, he had enjoyed the inestimable felicity of a religious education at home. His mother, Monnica, had been his best instructor. Neander truly says: "Whatever treasures of virtue and worth the life of faith, even of a soul not trained by scientific culture, can bestow, was set before him in the example of his pious mother."

The energy and penetration of intellect exhibited by the young A. excited the most flattering hopes. When he left home for Carthage, a joyous, ardent, and resolute student, a bright career of worldly prosperity seemed to open before him. But strong as A. was, the temptations of Carthage were stronger. His nature, deep, impetuous, and passionate, thirsted for excitement. He had just reached the age when happiness is conceived to be synonymous with pleasure, and Carthage, the second city of the empire, was rank as Rome in its sensual corruptions. A. fell. In his *Confessions*, he paints the frightful abyss into which he felt himself plunged; nor does he seek to excuse himself; on the contrary, the shadow of his guilt is thrown forward over all his boyish life, and he displays even a morbid zeal and acuteness in pointing out what others, less censorious, might term the frivolous errors of his childhood, but which seemed to A. the parents of his subsequent vices, and therefore equally bad and equally reprehensible. Before he had reached his 18th year, his mistress bore him a son, who was named Adeodatus—afterwards baptized along with him at Milan. The thing which appears to have first stirred his deeper being into life was a passage which he suddenly came across in the *Hortensius* of Cicero, treating of the worth and dignity of philosophy. To use the language of Neander: "The conflict now began in his soul which lasted through eleven years of his life. As the simplicity of the sacred Scriptures possessed no attractions for his taste—a taste formed by rhetorical studies and the artificial discipline of the declamatory schools—especially as his mind was now in the same tone and direction with that of the emperor Julian, when the latter was conducted to the Platonic theosophy; as, moreover, he found so many things in the doctrines of the church which, from want of inward experience, could not be otherwise than unintelligible to him, while he attempted to grasp, by the understanding from without, what can be understood only from the inner life, from the feeling of inward wants, and one's own inward experiences; so under these circumstances, the delusive pretensions of the Manichæan sect, which, instead of a blind belief on authority, held out the promise of clear knowledge and a satisfactory solution of all questions relating to things human and divine, presented the stronger attractions to his inexperienced youth." A. now became a professed Manichæan. Returning to his native town, he lectured for a short time on "grammar"—that is to say, on literature. Soon afterwards, he returned to Carthage, to pursue his profession under more favorable auspices. Here he wrote, in his 27th year, his first work, *De Apto et Pulchro*—a treatise on æsthetics, which has unfortunately been lost. About the same time his spiritual nature became keener and more imperative in its demands. The futile speculations of the visionary sect to which he had attached himself now became apparent. He had a series of interviews and conversations with Faustus, one of the most celebrated teachers of Manichæism; and these so utterly disappointed his expectations, that he left the society in disgust and sad bewilderment, after having wasted ten years in a fruitless search for wisdom and truth.

In 383 he went to Rome, followed by the tears, the prayers, and the anxieties of his excellent mother, who was not, however, bereaved of hope, for both her faith and her love were strong. After a short stay, A. left Rome, and proceeded to Milan, where he became a teacher of rhetoric. No change could have been more fortunate. At this time, the bishop of Milan was the eloquent and devout St. Ambrose. An intimacy sprang up between the two. A. often went to hear his friend preach. He was not, however, as yet a Christian. He had only emerged, as it were, from Manichæism

—the region of night-clouds and shadows—and was now gazing on the gray dawn of the Platonic philosophy, prophetic of the noontide splendors of Christianity which were soon to burst upon his vision. Still, A. did not afterwards despise this preliminary training; he was too great and honest a man for that. He confesses that the Platonic writings "enkindled in his mind an incredible ardor;" they awakened his deeper spiritual nature, which keenly upbraided him with his sins. Once more he studied the Bible, although from a purely Platonic point of view, and rather wishing to find in it "those truths which he had already made himself acquainted with from the Platonic philosophy, but presented in a different form." He began to think that Christ and Paul, by their glorious life and death, their divine morality, their great holiness, and manifold virtues, must have enjoyed much of that "highest wisdom" which the philosophers thought confined to themselves. For some time he clung to his Platonic Christianity, and shaped the doctrines of the Bible according to it; but when he found that it was weak to overcome temptations, and that "he himself was continually borne down by the ungodly impulses which he thought he had already subdued," the necessity of a living personal God and Savior to rescue him from the condemnation of his own conscience, and impart a sanctifying vitality to the abstract truths which he worshiped, shone clear through all the stormy struggles of his heart. In the eighth and ninth books of his *Confessions*, he has left a noble though painful picture of his inward life during this momentous crisis. It is sufficient to say that the spirit of God triumphed. On the 25th of April, 387 A.D., A. along with his natural son, Adeodatus, of whom he seems to have been justly fond, was baptized by Ambrose at Milan. Shortly after he set out on his return home. At Ostia, on the Tiber, his beloved mother, who had followed him to Milan, died; her eyes had seen the salvation of her son, and she could depart in peace. After her death, and before leaving Italy for Africa, A. wrote his treatises, *De Moribus Ecclesiæ Catholicæ et de Moribus Manichæorum; De Quantitate Animæ;* and *De Libero Arbitrio.* It is unnecessary to relate at any length the subsequent life of Augustine. His character and principles of action had become fixed, and he now brought the whole majesty of his intellect to bear upon the side of Christianity. Having, as was then customary for converts, divided his goods among the poor, he retired into private life, and composed several treatises—*De Genesi Contra Manichæos, De Musicâ, De Magistro,* and *De Verâ Religione,* which secured him a high reputation. In 391, he was ordained a priest by Valerius, bishop of Hippo; and during the next four years, though earnestly engaged in the work of preaching, contrived to write three different works. In 395, he was made colleague of Valerius. Then ensued a period of hot strife, known in church history as the Donatist and Pelagian controversies. A., as may naturally be supposed, having passed through so fierce a fire of personal experience on religious questions, would be very jealous both of what he *knew* to be the truth, and of what he only *thought* to be the truth. This, added to his acute and profound intellect, made him, in spite of the poverty of his historical erudition, a most formidable and relentless antagonist. But this portion of his career will fall to be treated more properly under Pelagius and Pelagianism (q.v.). In 397, appeared his *Confessions,* in 13 books. It is a deep, earnest, and sacred autobiography of one of the greatest intellects the world has seen. Passages of it have no parallel except in the Psalms of David. In 413, he commenced his *De Civitate Dei,* and finished it in 426. It is generally considered his most powerful work. Exception may be taken to much that it contains. The learning is no doubt very considerable, but it is not accurate. A. was an indifferent scholar: he had studied the Latin authors well; but of Greek "he knew little, and of Hebrew, nothing." Many of his reasonings are based on false and untenable premises, and he erred often in his etymological explanations; but in spite of these and other drawbacks, the final impression left on the mind is, that the work is one of the most profound and lasting monuments of human genius. In 428, A. published his *Retractationes,* in which he makes a recension of all his previous writings. It is a work of great candor. He frankly acknowledges such errors and mistakes as he had discovered himself to have committed, explains and modifies numerous statements, and modestly reviews his whole opinions. His end was now drawing nigh. In 429, the Vandals, under the barbarian Genseric, landed in Africa; next year they besieged Hippo. A., now in his 76th year, prayed that God would help his unhappy church, and grant himself a release out of this present evil world. He d. on the 28th of Aug., 430, in the third month of the siege.

No mind has exerted greater influence on the church than that of Augustine. Consistency of theological opinion is not to be looked for from him, nor from any of the church fathers. A larger sphere of freedom was permitted to religious speculation in those unfettered days, before creeds were encircled with that traditional sanctity they now possess. Nevertheless, we have little difficulty in determining the central tenets of his theological belief. He held the corruption of human nature through the fall of man, and the consequent slavery of the human will. Both on metaphysical and religious grounds, he asserted the doctrine of predestination, from which he necessarily deduced the corollary doctrines of election and reprobation; and finally, he strenuously supported, against the Pelagians, not only these opinions, but also the doctrine of the perseverance of the saints. At the same time, it is but fair to add that, even on such points, his language is far from uniform; that much of the severity of his doctrines arose from the

bitter and painful remembrance of his own early sins, and from the profound impression which the corrupt state of society in his time, and the vast desolations of barbarism, had made on his earnest and susceptible soul; and that, in his desire to give glory to God, he sometimes forgot to be just to man. In illustration of this may be mentioned the fact (see Neander, Mosheim, and Waddington's church histories) that the maxim which justified the chastisement of religious errors by civil penalties, even to burning, was established and confirmed by the authority of A., and thus transmitted to following ages. In his epistle to Dulcitius, a civil magistrate, who shrank from putting in force the edict of Honorius against heretics, he uses these words: "It is much better that some should perish by their own fires, than that the whole body should burn in the everlasting flames of Gehenna, through the desert of their impious dissension." In the opinion of Neander, it was to the somewhat narrow culture and the peculiar personal experience and temperament of Augustine, that the doctrines of absolute predestination and irresistible grace, first systematized by him, owed much of that harshness and one-sidedness which so long obstructed their general reception by the church, and which continue to render them repulsive to multitudes.

His life has been written by Tillemont, and his entire works have been repeatedly edited. The Benedictine edition, published at Paris in 11 vols. (1679–1700), is the best. Numerous editions of the *Confessiones* and *De Civitate Dei* have appeared; the most recent of the latter by Marcus Dods, D.D. In the "Library of Fathers of the Holy Catholic Church," are translations into English of A.'s *Confessions, Exposition on St. John's Gospel* and *on the Psalms, Sermons on the New Testament*, and *Short Treatises*. His *Sermon on the Mount* is translated by Trench, and his *Letters* by Rev. J. G. Cunningham.

AU'GUSTINE, Saint, first archbishop of Canterbury, was originally a monk in the convent of St. Andrew at Rome. In 596, he was sent, along with forty other monks, by pope Gregory I., to convert the Anglo-Saxons to Christianity, and establish the authority of the Roman see in Britain. The missionaries were kindly received by Ethelbert, king of Kent, whose wife Bertha, daughter of the king of the Parisians, was a Christian, and retained a Frankish bishop in her suite as chaplain. A residence was assigned to them at Canterbury, then called *Durovernum*, where they devoted themselves to monastic exercises and preaching. The conversion and baptism of the king contributed greatly to the success of their efforts among his subjects, and it is recorded that in one day A. baptized 10,000 persons in the river Swale. Nominal as much of this conversion must have been, there is abundant testimony to the fact that a marked improvement in the life and manners of the Anglo-Saxons followed the evangelistic labors of A. and his companions.

In 597, he went to Arles, by direction of the pope, and was there consecrated archbishop of Canterbury and metropolitan of England. On his return, he dispatched a presbyter and monk to Rome, to inform the pope of his success, and obtain instruction on certain questions. Gregory's advices with regard to the propagation of the faith are admirable examples of that pious ingenuity which has often characterized the missionary policy of the church of Rome. Thus, instead of destroying the heathen temples, A. was recommended to convert them into Christian churches, by washing the walls with holy water, erecting altars, and substituting holy relics and symbols for the images of the heathen gods. A.'s subsequent efforts to establish his authority over the native British church were not so successful as his missionary labors. He d. in 604, and was buried in the church-yard of the monastery bearing his name, founded by king Ethelbert. His body was removed to the cathedral of Canterbury in 1091. Bede's *Historia Ecclesiastica Gentis Anglorum* is the great authority for the life of St. A. A thoughtful and pleasing sketch of it will be found in the Rev. Arthur P. Stanley's *Historical Memorials of Canterbury*, Lond., 1855.

The site and remains of St. A.'s monastery were purchased in 1844 by Mr. Beresford Hope, by whom they were presented to the archbishop of Canterbury in trust, for the erection of a missionary college in connection with the church of England. This institution was incorporated by royal charter in 1848. The buildings, in which as much of the ancient structure as possible has been preserved, contain accommodation for about 45 students, whose course of study extends over three years. Twenty exhibitions have been founded in connection with the college.

AU'GUSTINES, or Augustin'ians, names given to several religious bodies in the Roman Catholic church. Whether St. Augustine ever framed any formal rule of monastic life, is uncertain; but one was deduced from his writings, and was adopted by as many as 30 monastic fraternities, of which the chief were the Canons Regular, the Knights Templars (q.v.), the Begging Hermits, the Friars Preachers or Dominicans (q.v.), and the Premonstratensians (q.v.). The Canons Regular of St. Augustine, or Austin Canons, appear to have been founded or remodeled about the middle of the 11th century. Their discipline was less severe than that of monks properly so called, but more rigid than that of the secular or parochial clergy. They lived under one roof, having a common dormitory and refectory. Their habit was a long cassock, with a white rochet over it, all covered by a black cloak or hood, whence they were often called Black Canons. In England, where they were established early in the 12th c., they had about 170 houses, the earliest, it would seem, being at Nostell, near Pontefract, in Yorkshire. In Scotland

they had about 25 houses: the earliest at Scone was founded in 1114, and filled by canons from Nostell; the others of most note were at Inchcolm in the firth of Forth, St. Andrews, Holyrood, Cambuskenneth, and Inchaffray.

The BEGGING HERMITS, HERMITS OF ST. AUGUSTINE, or AUSTIN FRIARS, were a much more austere order, renouncing all property, and vowing to live by the voluntary alms of the faithful. They are believed to have sprung from certain societies of recluses who, in the 11th and 12th centuries, existed especially in Italy without any regulative constitution. At the instigation, as is alleged, of the rival fraternities of Dominicans and Franciscans, pope Innocent IV., about the middle of the 13th c., imposed on them the rule of St. Augustine, whom they claimed as their founder. In 1256, pope Alexander IV. placed them under the control of a superior or president called a "general." In 1287, a code of rules or constitutions was compiled, by which the order long continued to be governed. About 1570, friar Thomas of Jesus, a Portuguese brother of the order, introduced a more austere rule, the disciples of which were forbidden to wear shoes, whence they were called *discalceati*, or "barefooted friars."

The degeneracy of the order in the 14th c., called into existence new or reformed Augustinian societies, among which was that Saxon one to which Luther belonged. But in his day, even these had fallen victims to the general corruption of the priesthood, and he inflicted serious injury upon it by his unsparing denunciations. After the French revolution, the order was wholly suppressed in France, Spain, and Portugal, and partly in Italy and southern Germany. It was diminished even in Austria and Naples. It is most powerful in Sardinia and America.

The name of A. was given also to an order of nuns who claimed descent from a convent founded by St. Augustine at Hippo, and of which his sister was the first abbess. They were vowed to the care of the sick and the service of hospitals. The Hôtel-Dieu at Paris is still served by them.

AUGUSTO'WO, a t. of Poland, the capital of a circle of the same name, on the Netta, a feeder of the Bug, 138 m. n.e. from Warsaw. It was founded by Sigismund Augustus, king of Poland, in 1557. It has woolen and linen manufactures, and some trade in horses and cattle. Great part of the surrounding district is occupied by lakes and marshes, or covered with forests. Pop. '67, 9354.

AUGUS'TULUS, ROMULUS, the last emperor of the western portion of the Roman empire. His name was Augustus, but the diminutive title under which he is universally known was given him by the Romans on account of the essential littleness of his character. He was the son of Orestes, a Pannonian of birth and wealth, who rose to high rank under the emperor Julius Nepos, whose favor he repaid by stirring up the barbarian troops in the pay of Rome to mutiny against him. On the flight of the emperor, Orestes conferred the vacant throne on his son A. (476 A.D.), retaining all substantial power in his own hands. Orestes, failing to conciliate the barbarians, who had helped him against Nepos, with a grant of the third of the lands of Italy, they, under the command of Odoacer, besieged him in Pavia, and capturing, put him to death. A. yielded at once, and being of too little consequence to be put to death, he was dismissed to a villa near Naples with an annual pension of 6000 pieces of gold. His after-fate is unknown.

AUGUSTUS, CAIUS JULIUS CÆSAR OCTAVIANUS, the son of Octavius and Atia (daughter of Julia, the younger sister of Julius Cæsar), was b. 23d Sept., B.C. 63. The Octavian family came originally from Velitræ, in the country of the Volsci; and the branch from which A. descended was rich and honorable. His father had risen to the rank of senator and prætor, but died in the prime of life, when A. was only 4 years old. A. was carefully educated in Rome under the guardianship of his mother and his step-father, Lucius Marcius Philippus. At the age of 12, A. delivered a funeral oration over his grandmother; at 16, he received the toga virilis. The talents of the youth recommended him to his grand-uncle, Julius Cæsar, who adopted A. as his son and heir. At the time of Cæsar's assassination (Mar. 15, B.C. 44), A. was a student under the celebrated orator Apollodorus, at Apollonia in Illyricum, where, however, he had been sent, chiefly with a view to gain practical instruction in military affairs. He returned to Italy, assuming the name of Julius Cæsar Octavianus, and at his landing at Brundusium, was welcomed by deputies from the veterans there assembled; but declining their offers, he chose to enter Rome privately. The city was at this time divided between the two parties of the republicans and the friends of Mark Antony; but the latter had, by adroit maneuvers, gained the ascendency, and enjoyed almost absolute power. A. was at first haughtily treated by the consul, who refused to surrender the property of Cæsar. After some fighting, in which Antony was worsted, and had to flee across the Alps, A., who had made himself a favorite with the people and the army, succeeded in getting the will of Julius Cæsar carried out. He found an able friend and advocate in Cicero, who had at first regarded him with contempt. The great orator, while imagining that he was laboring in behalf of the republic, was in fact only an instrument for raising A. to supreme power. When Antony returned from Gaul with Lepidus, A. joined them in establishing a triumvirate. He obtained Africa, Sardinia, and Sicily; Antony, Gaul; and Lepidus, Spain. Their power was soon made absolute by the massacre of those unfriendly to them in Italy, and by victories over the republican army in Macedonia, commanded by

Brutus and Cassius. After the battle of Philippi, won by A. and Antony, of which the former unjustly claimed all the credit, whereas it mainly belonged to the latter, the triumvirs made a new division of the provinces—A. obtaining Italy, and Lepidus, Africa. The Perusian war, excited by Fulvia, wife of Antony, seemed likely to lead to a contest between A. and his rival; but was ended by the death of Fulvia, and the subsequent marriage of Antony with Octavia, sister of Augustus. Shortly afterwards, the claims of Sextus Pompeius and Lepidus having been settled by force and fraud, the Roman world was divided between A. and Antony; and a contest for supremacy commenced between them. While Antony was lost in luxurious dissipation at the court of Cleopatra, A. was industriously striving to gain the love and confidence of the Roman people, and to damage his rival in public estimation. At length war was declared against the queen of Egypt, and at the naval battle of Actium (q.v.), B.C. 31, A. was victorious, and became sole ruler of the whole Roman world. Soon afterwards, Antony and Cleopatra ended their lives by suicide. The son of Antony by Fulvia, and Cæsarion, son of Cæsar and Cleopatra, were put to death; and in B.C. 29, after disposing of several affairs in Egypt, Greece, Syria, and Asia Minor, A. returned to Rome in triumph, and closing the temple of Janus, proclaimed universal peace.

His subsequent measures were mild and prudent. To insure popular favor, he abolished the laws of the triumvirate, adorned the city of Rome, and reformed many abuses. At the end of his seventh consulship (B.C. 27), he proposed to retire from office, in order that the old republican form of government might be re-established, but he was ultimately induced to retain his power. Hitherto, since Cæsar's death, the consul had been named Octavian; but now the title of *Augustus* (meaning "sacred" or "consecrated") was conferred on him. In the eleventh consulship of A. (B.C. 23), the tribunitian power was conferred on him for life by the senate. Republican names and forms still remained, but they were mere shadows. A. was in all but name absolute monarch. In 12 B.C., on the death of Lepidus, he had the high title of pontifex maximus, or high priest, bestowed on him. The nation surrendered to him all the power and honor that it had to give.

After a course of victories in Asia, Spain, Pannonia, Dalmatia, Gaul, etc., A. (9 B.C.) suffered the greatest defeat he had sustained in the course of his long rule, in the person of Quintilius Varus, whose army was totally destroyed by the Germans.

This loss so afflicted A. that for some time he allowed his beard and hair to grow, as a sign of deep mourning, and often exclaimed: "O Varus, restore me my legions!" From this time A. confined himself to plans of domestic improvement and reform, and so beautified Rome, that it was said, "A. found the city built of bricks, and left it built of marble." He also founded cities in several parts of the empire; and altars were raised by the grateful people to commemorate his beneficence; while by a decree of the senate, the name Augustus was given to the month Sextilis.

Though surrounded thus with honor and prosperity, A. was not free from domestic trouble. The abandoned conduct of his daughter Julia was the cause of sore vexation to him. He had no son, and Marcellus, the son of his sister, and Caius and Lucius, the sons of his daughter, whom he had appointed as his successors and heirs, as well as his favorite step-son Drusus, all died early; while his step-son Tiberius was an unamiable character whom he could not love. Age, domestic sorrows, and failing health warned him to seek rest; and to recruit his strength, he undertook a journey to Campania; but his infirmity increased, and he died at Nola (Aug. 19, A.D. 14), in the 77th year of his age. According to tradition, shortly before his death, he called for a mirror, arranged his hair neatly, and said to his attendants: "Have I played my part well? If so, applaud me!" A. had consummate tact and address as a ruler and politician, and could keep his plans in secrecy while he made use of the passions and talents of others to forward his own designs. The good and great measures which marked his reign were originated mostly by A. himself. He encouraged agriculture, patronized the arts and literature, and was himself an author; but only a few fragments of his writings have been preserved. Horace, Virgil, and all the most celebrated Latin poets and scholars, were his friends. His was the *Augustan age* of literature. His death threw a shade of sorrow over the whole Roman world; the bereaved people erected temples and altars to his memory, and numbered him among the gods.

AUGUSTUS, Elector of Saxony (1553–1586), son of duke Henry the pious, and of Katherine of Mecklenburg, was b. July 31, 1526, at Freiberg, then the seat of his father's court. While still a youth, he spent some time at Prague, and there formed an intimate friendship with Maximilian, king Ferdinand's son, afterwards emperor of Germany. In 1548, he married Anna, daughter of Christian III. of Denmark, who was universally popular on account of her devoted adherence to Lutheranism and of her domestic worth. After the death of his brother Maurice in 1553, A. succeeded to the electorate. His rule is chiefly noticeable as bearing upon the history of the newly established Protestant church. Equally intolerant and inconsistent in his theology, A. first used his utmost influence in favor of the Calvinistic doctrine of the sacraments; and then, in 1574, adopted the Lutheran tenets, and persecuted the Calvinists. On the other hand, however, it must be owned, to his honor, that, by his skillful internal administration, he raised his country far above the level of any other in Germany, introducing valuable reforms both in jurisprudence and finance, and giving a decided impetus to education, agriculture, manufactures, and commerce. He even wrote a book on the

management of orchards and gardens, and commanded that every newly-married pair should, within the first year of their marriage, plant two fruit-trees. The Dresden library owes its origin to him, as do also most of its galleries of art and science. His own favorite private pursuit was that of alchemy, in which the electress Anna also took a part. In the Jan. of 1586—the electress having died in the previous year—A. married a young princess of Anhalt, but died a month after, and was buried in the cathedral of Freiberg. He was succeeded by his son, Christian I.

AUGUSTUS II., FREDERICK, commonly called the Strong, elector of Saxony and king of Poland, second son of the elector, John George III., and of the Danish princess, Anna Sophia, was born at Dresden in 1670. His extraordinary strength was developed by a careful physical education, and his mental faculties more successfully cultivated than his morals. From 1687 to 1689 he traveled over the greatest part of Europe, but was prohibited by his father from visiting Rome. Upon his father's death (1691), he went to Vienna, and there formed an intimacy with Joseph, king of Rome, which materially influenced his politics. When, in 1694, he succeeded to his brother George as elector, instead of turning his arms against France, according to previous arrangement, he undertook the command of the Austro-Saxon army against the Turks in Hungary. After the battle of Olasch, in 1696, he returned to Vienna as a candidate for the throne of Poland, vacated by John Sobieski. Bidding higher than prince Conti for the crown (10 million Polish florins), and adopting the Catholic faith, he was elected king by the venal nobles; and having, by his imposing force, awed the adherents of Conti, he was crowned at Cracow, 15th Sept., 1697. On ascending the throne, he promised to regain, for his new kingdom, the provinces that had been ceded to Sweden; but his efforts to do this only led to the defeat of himself and his allies, his own deposition as king of Poland, the election of Stanislaus Leszcynski, and the ignominious peace of Altranstädt in 1706. So complete was his humiliation, that A. was compelled to send a letter of congratulation to the new Polish king, together with all the crown-jewels and archives. However, on receiving intelligence of the defeat of Charles XII. at Pultowa, in 1709, he declared the treaty of Altranstädt annulled, marched with a powerful army into Poland, formed a fresh alliance with the czar, and recommenced a war with Sweden, which continued raging with redoubled fury, till the death of Charles XII. at Fredericks-hall, in 1718, gave a new aspect to affairs, leading first to a truce, and eventually to a peace with Sweden. Meanwhile, a confederation, headed by a Polish nobleman, had been formed against the Saxons, and repulsed them with much success, till, in 1716, through the mediation of the czar, a compact was made between the Poles and A., agreeably to which the Saxon troops left the kingdom. The king now found himself obliged to employ conciliation, and the splendor of his dissolute court soon won the favor of the Polish nobles, who followed his example but too closely. Saxony had bitter cause to regret the union of the crowns. Its resources were shamefully squandered, even when want and famine were in the land, on the adornment of the capital, on the king's mistresses, his illegitimate children, and the alchemists who deluded him with hopes of the elixir of life. A supported the fine arts as ministering to luxury, but did little for the cause of science. Despotic in principle, though easy in temper; ambitious as well as luxurious; reckless alike in the pursuit of war and pleasure, death overtook him in the midst of projected festivities. On his way to the Warsaw diet, gangrene of an old wound set in, and he died in Feb., 1733, and was buried at Cracow. By his wife—a Protestant, and daughter of the margrave of Brandenburg-Kulmbach—he left an only son, who succeeded to him. The most celebrated of his numerous illegitimate offspring—amounting, it is affirmed, to somewhere about 300—was Maurice, count of Saxony.

AUGUSTUS III., FREDERICK, elector of Saxony and king of Poland, the son and successor of the above, was born in Oct., 1696, and carefully educated by his mother in the Protestant faith. At the age of 15, however, he left her tutelage for a tour through Germany, France, and Italy, where he changed his religion, secretly professing Catholicism at Bologna, in 1712, though the fact was not publicly known in Saxony till five years later. It is possible that an eye to the crown of Poland, and to an alliance with one of the Austrian princesses, may have had something to do with this step. After succeeding his father in the electorate in 1733, he was chosen king of Poland by a part of the nobility; and triumphing over the rival claims of Stanislaus Leszcynski, supported by Louis XV., was unanimously proclaimed three years later. He inherited his father's sumptuous tastes, though not his talents; and his love of art, cultivated by his Italian tour, enriched the gallery of Dresden with noble paintings. The government of his country he made over entirely to his prime minister, count von Bruhl, whose whole political system consisted in complete dependence upon Russia. In 1742, alarmed at the increased power Prussia had obtained by the conquest of Silesia, A. formed an alliance with Maria Theresa; and by the secret treaty of Leipsic, contracted to supply her with 50,000 men. But their united troops were completely routed by the Prussians in 1745; and Frederick II. pushing on into Saxony, A. had to escape from his capital, saving his art-treasures, but leaving his state-papers in the hands of the conqueror. In 1746, the peace of Dresden restored him Saxony; but the close of the year again saw him embroiled with Prussia. Joining the camp at Pirna, he narrowly escaped being

taken prisoner, and had to flee to Poland, where his popularity, never very great, was much diminished by his recent reverses in Saxony, added to which the empress Catharine of Russia used every effort to dislodge him, as being an ally of France. At the conclusion of the peace of Hubertsburg, A. returned to Dresden, where he died in 1763. His son, Frederick Christian, succeeded him in the electorate, and Stanislaus Poniatowski became king of Poland.

AUGUSTUS FREDERICK, 1773–1843, Prince of Great Britain and Ireland, duke of Sussex, sixth son of George III. At Rome he married Lady Augusta Murray, daughter of the earl of Dunmore, a Roman Catholic; but the marriage was annulled because he had acted without the consent of the crown. She separated from him at once, and their children, a son and a daughter, took the name of D'Este. In 1801, A. was made a peer, with a grant of £12,000 a year, to which £9000 was subsequently added. He was a liberal on most questions, and favored the abolition of the slave-trade, Roman Catholic and Jewish emancipation, free trade, and the reform bill. In 1810, he was grand master of freemasons; in 1816, president of the society for the encouragement of useful arts; and in 1830, president of the royal society. The prince was a liberal patron of literature and the arts, and possessed an unusually fine library.

AUK, *Alca*, a genus of web-footed birds, the type of a family called *alcadæ*, which was in great part included in the Linnæan genus *alca*, and to many of the species of which, now ranked in other genera, the name A. is still popularly extended. The *alcadæ* are amongst those web-footed birds collectively called *brachypteres* (i.e., short winged) or divers by Cuvier, remarkable for the shortness of their wings, which they employ as fins or paddles for swimming under water, some being even incapable of flying; and for the position of their legs, further backward than in other birds, which makes walking difficult, and compels them, when on land, to maintain an upright attitude. They are distinguished by the very compressed bill, which, in the true auks, is vertically elevated, and so sharp along the ridge as to resemble the blade of a knife; and by their entirely palmated feet, destitute of hind toes. The auks are entirely confined to the seas of the northern hemisphere—the penguins taking their place in the southern—and are most abundant in the colder regions. All of them have a dense plumage, which generally exhibits on its surface a beautifully polished appearance and silvery lustre. The genus *alca*, as restricted by Cuvier and others, contains only two species, distinguished from the puffins (q.v.), which also belong to this family, chiefly by the greater length of the bill, and its being covered with feathers as far as the nostrils. The bill, both in the auks and puffins, is transversely and strongly grooved. But even the two known species of the restricted genus *alca* differ from one another in a most important particular—the wings of the one, the great A., being so short that it is quite incapable of flight, like the penguins, of which it may be deemed the true northern representative, whilst the other, the razor-bill, has comparatively long wings, and flies well.—The GREAT A. (*alca impennis*), so far as is known, is now extinct. It was as large as a goose. It was an inhabitant of the most northerly shores, and a very rare visitant of the Orkney and Shetland islands and the Hebrides. It was almost equally rare in Norway and Sweden, but was formerly frequent in Iceland and Greenland, and localities on the coasts of Labrador and Newfoundland. The rapidity with which this bird moved under water was extraordinary; one of them having been pursued by a six-oared boat for hours in vain. Like most of the *alcadæ*, the great A. laid only one egg, about 5 in. in length, and 3 in its greatest breadth. The egg was laid on the bare rock, without any attempt at a nest.—The RAZOR-BILL (q.v.) (*A. torda*) is the only other species now commonly included in the genus *alca*. The name LITTLE A. is often given to a bird also called the ROTCHE (q.v.) (*mergulus alle*, formerly *alca alle*), common in arctic regions. —The common puffin is sometimes called the Labrador auk.—The northern parts of the Pacific ocean abound in auks remarkable for a somewhat quadrangular bill, notched near the tip, and which form the genus *phaleris*. One of them, *P. psittacula* is known as the parrakeet auk. —All the auks feed upon fishes, crustaceans, and other marine animals, which they pursue under water, and for which they dive to great depths.

AULAF, or ANLAF, d. 980; a pagan king of Northumberland. Athelstan expelled him from Northumbria, whence he fled to Ireland. In 937 he tried to recover his kingdom, but was driven out and went back to Ireland to ravage that country. After Athelstan's death, A. recovered Northumbria by defeating Edmund at Tamworth. Edred, Edmund's successor, compelled A. to embrace the Christian religion; but the Christians themselves drove him out, and he once more went to Ireland, where he defeated and put to death Murdock, king of Leinster, in 957. Other princes fell before him, and he called himself king of Ireland. In 980 he lost his son and heir, and went on a pilgrimage to Iona, where he died.

AULAPOLAY', or ALEPPI, a t. of India, in the native state of Travancore, on the sea-coast, in 9° 30′ n. lat., and 76° 24′ e. long. There is no shelter for shipping, but ships anchor 4 or 5 m. from the shore. There is, however, a considerable trade in timber, betel-nut, coir, pepper, and cardamoms. This t. communicates with Quilon and Trivandrum on the s., and with Cochin on the n., by canals parallel with the sea-coast, and connecting a series of lakes or back-waters. Between these and the sea is a com-

munication by a wide creek, through which the timber for exportation is floated, which is brought from the forests of the rajah of Travancore on the western Ghauts.

AULIC COUNCIL (Lat. *aula*, court or hall), one of the two highest courts of the old German empire, co-ordinate with the imperial chamber. It came into existence in 1495, and seems to have been at first employed principally in preparing business matters regarding the crown lands and the empire generally, in order to expedite the decisions of the imperial chamber. It soon, however, began to assume or acquire higher functions. After 1502, the states submitted important grievances to its independent consideration; but it did not receive a fixed constitution before 1559. In 1654, it was formally recognized as the second of the two supreme courts, and equal in dignity to the imperial chamber. It was composed of a president, a vice-president, a vice-chancellor, and eighteen councilors, who were all chosen and paid by the emperor, with the exception of the vice-chancellor, who was appointed by the elector of Mainz. Of the eighteen councilors, six were Protestants, whose votes, when they were unanimous, could not be set aside by those of the others, so that a religious parity was to some extent preserved. The councilors were divided into three classes—counts, barons, and men of learning—all of whom were on a footing of equality, except that the last mentioned received a higher salary, and were usually advanced into the ranks of the nobility. The council held aloof from politics, but under its jurisdiction were placed: 1st. All matters of feudality in which the emperor was immediately concerned; 2d. All questions of appeal on the part of the states from decisions in favor of the emperor in minor courts; 3d. Whatever concerned the imperial jurisdiction in Italy. On the death of the emperor, the council was dissolved, and had to be reconstructed by his successor. It finally ceased to exist on the extinction of the old German empire in 1806.

AULIS, a t. in Bœotia, on the Euripus strait, where the Greek fleet assembled before sailing for Troy. Its temple of Artemis was standing in the time of Pausanias, but the t. contained only a few workers in pottery.

AULNAY DE CHARNISÉ, CHARLES DE MENOU, a French land-owner, conspicuous in the history of Acadie, or Nova Scotia. He was agent first for Isaac de Radzilly, proprietor of Acadie, and afterwards for Charles, the brother of Isaac, whose rights he purchased. There was a long contest between A. and La Tour, a rival proprietor, in which both sought aid from New England. A. triumphed, capturing Mme. La Tour, in 1645, after which he was appointed governor. His widow married his rival, La Tour.

AULUS GELLIUS, a Latin author in the time of the Antonines, of whom little is known beyond his *Noctes Atticæ*, a mass of ill-digested but valuable information concerning the men and manners of the age.

AUMALE, a t. in France, 40 m. n.e. of Rouen; pop. '66, 2929. Here, in 1592, in a battle between the Spaniards and French, Henry of Navarre was wounded. A. was a county in the early part of the 15th c., and belonged to Claude Lorraine, son of Rene II. Claude was created duke of Guise, and became the head of that famous house.

AUMALE, a t. of Algeria, on one of the headwaters of the Sahel, 57 m. s.e. from Algiers. It is situated on the great road from Algiers to Constantine. It is a strong military post, with barracks, magazines, and hospitals. Pop. 5196, of whom 1468 are Europeans.

AUMALE, CHARLES DE LORRAINE, Duc d', b. 1554, was an ardent partisan of the league in the politico-religious wars which devastated France in the latter half of the 16th century. The aim of the league was ostensibly to suppress the Huguenots, but in reality to secure the supreme power to the Guises. Closely allied by blood to this crafty and ambitious family, A. from the very first entered with fanatical sympathy into its schemes, and after the murder of the duke of Guise at Blois, in Dec., 1588, he became, along with the duke of Mayenne, the leader of the party. In 1589, he seized Paris, dissolved the parliament, and imprisoned its members. Shortly after, he put himself at the head of a body of troops to attack the town of Senlis, but was defeated by La Noue, and compelled to retreat. Always unfortunate in war, his presence seemed invariably to insure the overthrow of his friends. He commanded a portion of the forces of the league at the battles of Arques and Ivri, where the Huguenots triumphed under their skillful and sagacious monarch, Henry IV. But A. was as obstinate as he was unlucky, and in the end proved himself as traitorous as he was obstinate. He held out for the league in Amiens until the populace expelled him, when he suddenly allied himself with the Spaniards who had invaded Picardy, refused the royal pardon, and delivered over to the enemy several places in his possession. For this he was impeached, condemned, and sentenced to be broken alive on the wheel. His property was confiscated, but he himself escaped. He lived in exile till his death, which took place at Brussels, in 1631. He left no male posterity.

AUMALE, HENRI-EUGENE-PHILIPPE, LOUIS D'ORLÉANS, Duc d', b. at Paris, Jan. 16, 1822, is the fourth son of the late king of France, Louis Philippe. He enjoyed the privilege —so rare among princes—of being educated along with his fellow-men, at the college of Henri IV., where he exhibited considerable talent, and obtained several honors. When 16 years of age, he entered the army, soon distinguished himself by his bravery, and passed rapidly through the various grades of rank. In 1843, he embarked at Brest for Algeria, where he commanded a subdivision of the French army, and performed some brilliant

exploits, the most signal of which was his surprising Abd-el-Kader, when encamped in the environs of Goudjilab. By this *coup de main*, which occurred on the 16th of May, 1843, there fell into his hands a multitude of cattle, 4 standards, 3600 prisoners, and the correspondence and treasure of the emir. He was, in consequence, elevated to the rank of lieutenant-general, and appointed to the government of the province of Constantine. In 1847, he succeeded marshal Bugeaud in the governor-generalship of Algeria. While holding this high office, he was exposed to a series of bitter attacks by the democratic "opposition" in the chamber of deputies, but was ably defended by Guizot. After the expulsion of his father, he withdrew from Algeria, having first, with self-denying patriotism, exhorted the colony peaceably to obey the orders of the metropolis. He then resided in England till 1871, when he returned to France, and was elected a member of the assembly. He was elected a general of division in 1872, and presided over the council of war which tried marshal Bazaine. He was elected a member of the academy in 1871. His chief writings are *Les Zouaves et les Chasseurs-à-pied*, and *Histoire des Condés*.

AUNE, the French cloth-measure corresponding to the English *ell*. Both words are derived from the Lat. *ulna*. The English ell = $1\frac{1}{4}$ yard = 45 inches; the French *aune usuelle* (or *nouvelle*) = $1\frac{1}{8}$ mètre = $47\frac{1}{4}$ inches English. The old *aune* was a little shorter.

AUNOY, MARIE-CATHERINE-JUMELLE DE BERNEVILLE, Comtesse d', a celebrated French authoress of the reign of Louis XIV. She was b. about 1650, and d. at Paris, Jan., 1705. She composed fairy tales, romances, and historical memoirs. Among her fairy tales may be mentioned, *The Yellow Dwarf*, *The White Cat*, and *Cherry and Fair Star*. Many of these fictions have been translated into English, and are greedily read by schoolboys. They have, both in France and other countries, gone through numerous editions, and are the sole monuments of her fame; for her sentimental novels, *Hippolyte*, and *Comte de Duglas*, have long ago vanished from the eyes of men; while her historical memoirs are not regarded as at all trustworthy.

AURANTIA'CEÆ (from *aurantium*, modern Latin for an orange), a natural order of exogenous plants, consisting of trees and shrubs, often of great beauty. Both leaves and bark are generally very smooth, and all parts are filled with little transparent receptacles of a fragrant volatile oil, which especially abounds in the leaves and in the rind of the fruit. The leaves are alternate, and always articulated with their stalks, which are frequently winged. The flowers have a short 3 to 5 toothed, withering calyx, and 3 to 5 petals, which are broad at the base, sometimes slightly coherent, and imbricated in bud. The stamens are equal in number to the petals, or a multiple of their number; the filaments sometimes slightly coherent in one or more bundles; the anthers terminal and erect. The stamens and petals are inserted on a disk. The ovary is free; there is one style with a thickish stigma. The fruit (a *hesperidium*) is pulpy, with a leathery or spongy rind, of one cell, or of a number of separable cells; the seeds attached to the axis, with thick cotyledons and no albumen, not unfrequently containing more embryos than one. —The order contains about 100 known species, natives of warm climates, and almost all of the East Indies. The species of the genus citrus (q.v.) are the best known, among which are the orange, lemon, citron, etc. But the order contains many other plants producing agreeable fruits, among which the *ægle marmelos* (see ÆGLE)—called bhel or bael, in India—*cookia punctata* (the wampee), *glycosmis citrifolia*, and *triphasia trifoliata* deserve particular notice. The fruits, ripe and unripe, juice and rind, the flowers, leaves, bark, etc., of a number of species are employed medicinally. The medicinal uses of *ægle marmelos* have been already noticed in the article ÆGLE; those of the species of *citrus* will be mentioned under their proper heads. The leaves of *bergera kœnigii* are used by the Hindoos as a stomachic and tonic, the bark and roots as stimulants.—*Feronia elephantum*, a large tree growing in most parts of India, yields a gum which closely resembles gum-arabic, and is used for similar purposes. The young leaves of this tree have a smell like that of anise, and are used by the native practitioners of India as a stomachic and carminative.—*Skimmia* (or *limonia*) *laureola* and *skimmia japonica* are remarkable exceptions in this order, as to the climate to which they are adapted: the former grows on the cold and lofty mountains of the n. of India, braving frost and snow; the latter, a beautiful shrub, recently introduced into Britain from Japan, is perfectly hardy even in the severest winters; its evergreen leaves and pretty little red berries remaining quite uninjured by frost, whilst its small white flowers, produced early in summer, have the fragrance of orange blossoms.

AURE'LIA. See CHRYSALIS.

AURELIA'NUS, LUCIUS DOMITIUS—also named CLAUDIUS DOMITIUS and VALERIUS —one of the most powerful of the Roman emperors, was of very humble origin, his father having been a husbandman. He was b. about A.D. 212, and enlisting early as a common soldier, he rapidly distinguished himself, and held the highest military offices under Valerianus and Claudius II. On the death of Claudius (A.D. 270), A. was elected emperor by the army. He commenced his reign by vigorous opposition to the barbarian Alemanni, or Marcomanni, whom he expelled. Thereafter, he commenced the erection of a new line of fortified walls round Rome, which were not completed till the reign of Probus (A.D. 276). Their ruins still mark the boundaries of Rome in the time of Aurelian. Finding that the province of Dacia (now Wallachia) could not be maintained

against the assaults of the Goths, he surrendered it, on certain conditions, and strengthened the frontier of the Roman empire by making the Danube its boundary. He next turned his attention to the east, where the renowned queen, Zenobia (q.v.), had extended her sway from Syria to Asia Minor and Egypt. A. defeated her in two battles, and besieged her in Palmyra, from which she attempted to escape, when she saw defense would prove unavailing. She was, however, taken prisoner, and soon after the city surrendered, and was treated leniently. Shortly after A. had departed, a new insurrection took place. He returned in 273, and gave the splendid city up to destruction. A. was again called to the east by a rebellion in Egypt, instigated by Firmus, a merchant of great influence, which he speedily quelled. Besides, Tetricus, who had held imperial power in Gaul since before the death of Gallienus, finding himself unable to wield, surrendered it to Aurelian. By restoring good discipline in the army, order in domestic affairs, and political unity to the Roman dominions, A. merited the title awarded to him by the senate—"restorer of the Roman empire." He fell a victim to conspiracy during his campaign against the Persians (A.D. 276).

AURE'LIUS, MARCUS. See ANTONINUS.

AURELLE, or D'AURELLE, DE PALADINES, b.1803; a French soldier, distinguished in the Crimean war. In the German war he was the commander of the fifth French division at Metz. After Napoleon's fall he organized the army of the Loire, drove Von der Tann from Orleans, and won the first victory for France, for which he received the chief command of the army of the Loire. He was repulsed in an attack upon the army of prince Frederick Charles, and beaten by the grand duke of Mechlenberg at Artemay; the next day prince Frederick drove him back to the forest of Orleans and took possession of the town. A. was soon afterwards removed from his command, and offered that of the camp at Cherbourg, which he refused, and he also refused to succeed gen. Chanzy. In the national assembly he was opposed to continuing the war. At a later period he was commander of the national guards in the department of the Seine, and a member of the Bazaine court-martial.

AURE'OLA, or AU'REOLE, the halo, or "glory," with which old painters encircled the heads and sometimes the entire persons of angels, saints, and martyrs. The circle with a cross was given to the Saviour only; without the cross, to canonize saints. Though supposed to be a Christian invention, it appears that it was used long before Christ in pictures of Hindoo deities.

AU'REUS, or DENA'RIUS AUREUS, the oldest standard gold coin of Rome, coined 207 B.C.; average weight, 121 grains.

AU'RICLES, two cavities of the heart. See HEART.

AURIC'ULA, *Primula auricula*, a plant of the same genus with the primrose (q.v.), much cultivated in flower-gardens. The A. has long been a florist's flower. It was highly esteemed by the Romans, and has, at least since the beginning of the 18th c., received particular attention from the florists of England and Holland. It is one of those flowers, the cultivation of which is often most successfully prosecuted in the little gardens of operatives near large towns. Lancashire is particularly famous for it.—The A. has smooth, dark-green leaves, scapes (or leafless stems), and calices, covered with a mealy powder. A similar fine meal appears also on the flowers, and adds much to their beauty. The A. is a native of the Alps and other mountains of the middle and s. of Europe, and of sub-alpine situations in the same countries. It is found also on the Caucasus and the mountains of Syria; it grows in shady and moist places. In a wild state, it has comparatively small flowers, of a simple yellow color, on short stalks, forming an umbel of generally six or seven on one scape, with the same delightful fragrance which aids so much to made it a favorite flower in cultivation. The leaves are used by the inhabitants of the Alps as a remedy for coughs.

By cultivation and art, the A. has been brought to great beauty and splendor of color. Red, pink, crimson, apple-green, and mulberry are the chief colors which the different varieties exhibit. More than 1200 varieties have been reckoned, and new ones are continually raised from seed. Some of them are entirely of one color, others of two or more; some are delicately shaded, and some variegated. The mere color of an A. is not of so much consequence, in the eye of a florist, as the form and shading. The chief requisites of a good A. are large flowers, so many of them on one scape as to give fullness to the umbel, the flower-stalks so strong that the flowers do not hang down; the scape itself must be so tall, that the umbel of flowers may rise completely above the leaves, and so strong as to bear it erect; the flower must be nearly round; the white or yellow eye in its center must be distinct and round, its color not mixing with the ground color, which, however, may mix at the outer part with the green of the margin. The green margin adds much to the beauty of many varieties. The mealiness of the flower differs much in different varieties.—The A. blooms in April and May, and often also a second time in the end of autumn, which adds to the charms of the flower-border, although it is to the first or proper flowering-season that the florist looks. It succeeds best in a rich light soil, and cultivators diligently prepare for it composts of various kinds, but in general consisting chiefly of fresh loamy soil, and of well-rotted horse or cow dung often with the addition of a little sand. The finer varieties are always culti-

vated in pots, and require great attention. They are protected from the severe weather of winter, and during the flowering-season, from wind and rain. They ought, however, previous to flowering, to stand in an airy, sunny situation. Their delicacy forms a striking contrast to the natural hardiness of the plant; but few sights are more pleasing than that of a collection of choice auriculas, tastefully arranged. They are propagated by offsets, generally in the latter part of August.—When it is proposed to raise the A. from seed, care ought to be taken to select the finest flowers, which are encouraged to ripen their seeds by exposure to sun and air, hand-glasses being placed over them during heavy rains. The seed is sown either in autumn or spring, generally in boxes placed under shelter, or in a slight hot-bed. The more weakly plants are tended with particular care, as they are generally found to produce the finest flowers.

The name A., originally Latin, is derived from *auris*, an ear on account of a fancied resemblance of the leaves to the ears of an animal.

AURIC'ULA, a genus, and AURICU'LIDÆ, a family of gastropod mollusca. They have a spiral shell, covered with a horny epidermis, the first whirl very large and the spire short, the aperture elongated and toothed. They belong to that section of gastropods in which the sexes are united in the individual, and to the same order with the common snails, having respiratory organs adapted for breathing in air, although some of them are capable of subsisting for a considerable time in water. Some of them inhabit fresh-water marshes, and others prefer the vicinity of salt water. They generally belong to warm climates, and some of them attain a large size. *Auricula midæ*, a native of the East Indies, is known to shell collectors by the name of Midas's ear.

AURIC'ULAR CONFESSION. See CONFESSION.

AURIC'ULATE, in botany, a term applied to leaves, stipules, etc., and signifying that they have at the base two small ear-like lobes.

AURIFABER (Lat. for GOLDSCHMIDT), JOANNES, 1519–79; a Lutheran divine, friend and companion of the reformer. He was educated at Wittenberg, became tutor to count Mansfeldt, and in the war of 1544 was with the army as chaplain. Afterwards he lived with Luther as his secretary, and was present at his death. Half of the next year he was in prison with the elector of Saxony, who had been captured by Charles V. He was for some years court preacher at Weimar, and in 1566 was appointed minister of the Lutheran church at Erfurt, holding the place until his death. He collected many of Luther's manuscripts and letters, and assisted in editing them. He also published *Luther's Table Talk*, in 1566.

AURI'GA, or THE WAGONER; a northern constellation in which is Capella, a very brilliant star of the first magnitude.

AURILLAC, a t. of France, capital of the dep. of Cantal (Auvergne). A. is situated in a pleasant valley on the banks of the Jourdanne, about 269 m. s. from Paris. It is said to owe its origin to a Benedictine monastery founded in the 9th c. by St. Gerard. The English, in the 14th and 15th centuries, often besieged the town, and it was frequently taken and pillaged during the religious wars in France in the 16th century. The streets are wide, but irregular, and are kept clean by streams supplied by a reservoir above the town and by a canal from the Jourdanne. The neighboring quarries supply slates to cover the houses. The principal buildings of A. are the churches of Notre Dame and St. Gerard, St. Stephen's castle, the theater, college buildings, which contain a valuable public library, and the corn market. There is also a monument erected to the memory of the French philanthropist, M. de Montyon. Paper, jewelry, lace, copper utensils, leather, and beer are the chief industrial products. Pope Sylvester II. was b. at A., and the infamous Carrier of the first French revolution. Pop. '76, 10,399.

AURIOL, a t. in France, in the dep. of Bouches-du-Rhône, 16 m. n.e. of Marseilles; pop. '66, 5182. The manufacture of flags is a prominent business, and there are coal-mines near the town.

AUROCHS, the European bison; a wild animal of the *bos* family, once plentiful over northern Europe, but now scarce and probably to be found only in the royal Lithuanian forests, where it is protected. The A. was probably contemporary with the mammoth, and it is thought to be the animal described in Cæsar's works as abundant in the forests of Gaul. There were two species, *bos urus* and *bos primigenius;* and of both fossil remains are found in post-tertiary deposits in Europe and America. It has been suggested that the animal furnished food for prehistoric mankind.

AURORA (styled *Eos* by the Greeks), the goddess of the dawn, or "morning redness," was the daughter of Hyperion and Theia, and sister of Helios and Selene, and wife of the Titan Astræus. Zephyrus, Boreas, Notus, Hesperus and the other stars were her children. She was described as rising in the morning from her bed in the ocean, borne along on a chariot drawn by the divine steeds Lampus and Phaëton, ascending heaven from the river Oceanus, where she lifted with her "rosy fingers" the curtain of night, and announced the light both to gods and men. Homer frequently describes A. as the goddess of day, and the tragic writers identified A. with *Hemera* (the day). She was represented as clothed in a rosy-yellow robe, with a star shining on her forehead, and a torch in her right hand. She had a passion for mortal youths, and carried off Orion, Cleitus, and Tithonus.

AURORA, a city in Kane co., Ill., on Fox river, and the Chicago and Iowa, and Chicago, Burlington and Quincy railroads, 38 m. s.w. of Chicago; pop. '80, 12,059. The river furnishes abundant water-power for manufacturing purposes. There are railway repair shops here, which employ about 1000 men.

AURORA, a city in Dearborn co., Ind., on the Ohio river, and the Louisville branch of the Ohio and Mississippi railroad; 25 m. below Cincinnati. It has a number of manufactories, but the river trade is the most important business. Pop. '70, 3304.

AURORA BOREALIS, or NORTHERN LIGHTS, (Ger. *Nordlicht*), the name given to the luminous phenomenon which is seen towards the n. of the heavens by the inhabitants of the higher latitudes. During the winter of the northern hemisphere, the inhabitants of the arctic zone are without the light of the sun for months together, and their long dreary night is relieved by the light of this beautiful meteor, which occurs with great frequency in these regions. Those who have explored the southern seas have seen the same phenomenon in the direction of the south pole, so that the term polar lights might be more appropriate than northern lights to designate the aurora. The appearance of the A. B. has been described by a great variety of observers, both in northern and central Europe, all of whom give substantially the same account of the manner in which the phenomenon takes place. It is briefly as follows: A dingy aspect of the sky in the direction of the n. is generally the precursor of the aurora; and this gradually becomes darker in color, and assumes the form of a circular segment, surrounded by a luminous arch, and resting at each end on the horizon. This *dark segment*, as it is called, has the appearance of a thick cloud, and is frequently seen as such in the fading twilight before the development of the auroral light. Its density must, however, be very small, as stars are sometimes seen shining brightly through it. This dark segment is bounded by a luminous *arch* of a bluish-white color, which varies in breadth from 1 to 6 diameters of the moon, having the lower edge sharply defined, and the upper edge only when the breadth of the arch is small. This arch may be considered to be a part of a luminous ring elevated at a considerable distance above the earth's surface, and having its center corresponding with some point near the north pole. An observer several degrees s. of this auroral ring would see towards the n. only a small arc of it, the larger part being hid by the earth; to one situated not so far s., it would appear as a larger and higher arch; to one placed below it, it would be seen as an arch passing through the zenith; and to one situated within the ring and further n., it would be found as an arch culminating in the s. On this supposition, nearly all the various positions of the auroral arch may be accounted for. The center of the ring corresponds probably with the magnetic n., which is at present situated in the island of Boothia Felix. Hence it is that in Greenland, which is situated to the e. of this island, the auroral arch has been seen stretching from n. to s. with its highest point in the w. The luminous arch, once formed, remains visible for several hours, and is in a constant state of motion. It rises and falls, extends toward the e. and towards the w., and breaks sometimes in one part, sometimes in another. These motions become all the more observable when the arch is about to shoot forth *rays;* then it becomes luminous at one point, eats in upon the dark segment, and a ray of similar brightness to the arch mounts with the rapidity of lightning towards the zenith. The ray seldom keeps the same form for any length of time; but undergoes continual changes, moving eastward and westward, and fluttering like a ribbon agitated by the wind. After some time, it gradually fades in brightness, and at last gives way to other rays. When the aurora attains its full brightness and activity, rays are projected from every part of the arch, and if they do not rise too high, it presents the appearance of a comb furnished with teeth. When the rays are very bright, they sometimes assume a green, sometimes a violet, a purple, or a rose color, giving to the whole a variegated and brilliant effect. The whole display will sometimes assume the form of a long banner waving in the breeze in a horizontal direction, making a most gorgeous and magnificent display, but this phenomenon is not frequently seen. When the rays darted by the luminous arch are numerous and of great length, they culminate in a point which is situated in the prolongation of the dipping needle, somewhat s.e. of the zenith. There they form what is called the *boreal crown;* and the whole heavens, towards the e., w., and n., present the appearance of a vast cupola of fire, supported by columns of variously colored light. When the rays are darted less brilliantly, the crown first disappears, then, here and there, the light becomes faint and intermittent, till at last the whole phenomenon fades from the sky.

The preceding description indicates the general features of the appearance of the A. B.; but several auroras have been described which presented striking peculiarities. Sometimes the phenomenon assumed the form of one or more curtains of light, depending from dingy clouds, whose folds were agitated to and fro, as if by the wind. Sometimes this curtain seemed to consist of separate ribbons of light, arranged side by side in groups of different lengths, and attaining their greatest brilliancy at the lower edges. In this country the A. B. seldom occurs with the distinctness and brilliancy which attend it in northern latitudes, but the description just given portrays the type to which such appearance of the meteor more or less approximates.

The height of the aurora has been variously estimated. The first observers were

inclined to place the seat of it beyond the atmosphere; but this hypothesis is untenable, as the aurora does not seem to be affected by the rotation of the earth, but appears to be in every respect a terrestrial phenomenon. By taking observations of the altitude of the highest point of the arch of the same aurora at different stations, heights varying from 5 to 500 m. have been calculated. The cause of these widely differing results may be found in the probability that exists of each observer seeing a different arch of the aurora for himself, and he is, in consequence, furnished with no comparable or reliable data for his calculations. It is now, however, generally admitted, on what are considered to be sufficient grounds, that the A. B. occurs at various heights, and that it is seldom found beyond 90 m. above the surface of the earth. The distance of the stations at which the same aurora has been visible, indicates the enormous geographical extent, and likewise the great altitude which the phenomenon frequently attains. One aurora, for instance—that which occurred on the 3d of Sept., 1839—was seen in the Isle of Skye by M. de Saussure; at Paris, by the astronomers of the observatory; at Asti, in northern Italy, by M. Quetelet; at New Haven, in Connecticut, by Mr. Herrick; and at New Orleans, by credible observers. On the other hand, some observers of eminence assert that the aurora sometimes descends to the region of the clouds, and appears almost as a local phenomenon. A brilliant aurora was seen by Mr. Farquharson, the minister of Alford, in Aberdeenshire, on the 20th of Dec., 1829, from 8 to 11:30 in the evening, above a thick bank of clouds, which covered the tops of the hills to the n. of where he lived, and which never attained an altitude of more than 20°. The same aurora was seen in the zenith, at 9:15, by Mr. Paul, another minister, at Tullynessle, which is about 2 m. n. of Alford, so that the height of it could not have been quite 4000 ft.

The noise that is alleged to accompany the A. B. in high latitudes would indicate for it a comparatively moderate height. Some of those who have heard it, compare it to the noise that is produced by the rolling of one piece of silk upon another; and others, to the sound of the wind blowing against the flame of a candle. In Siberia, it has been related that this noise sometimes resembles that attending the discharge of fireworks; and that the dogs of the hunters, when overtaken by such an aurora, lay themselves with terror on the ground.*

The intimate connection between the A. B. and the magnetism of the earth is shown by various facts. During the occurrence of the phenomenon, the magnetic needle appears very much disturbed, sometimes deviating several degrees from its normal position, and appearing to be most affected when the aurora is brightest; and this oscillation is frequently perceived far beyond the district where the aurora is seen. The vertex, likewise, of the luminous arch is almost always found to be in or very near the magnetic meridian, and the boreal crown has its seat in the prolongation of the freely suspended needle. There seems, moreover, to be a connection between the magnetic poles of the earth in regard to the aurora for, so far as has been ascertained, the meteor occurs simultaneously at both. The A. B. appears to be an electric discharge connected with magnetic disturbance. If one of Gassiot's vacuous tubes be brought near an electric machine, or between the poles of an induction coil, flashes of light pass between the ends, which bear a striking resemblance to the A. B. A comparison of the spectra of the two goes far to establish identity. The auroral spectral line, according to Angström, is a yellow line near the sodium line, and is the same as the air line seen in the solar light when the sun is near the horizon. Other lines, however, have been seen, which cannot as yet be produced by the physicist from any known substance.

A line drawn through the s. of Spain to the n. of the Sandwich islands, and through Cuba, marks the southern limit of the A. B. (in the northern hemisphere); though occasional displays have been noticed even further s. To the n. of a line passing through Edinburgh, the frequency of the A. B. rapidly increases, until a maximum is reached in a line through the n. of Spitzbergen, after which the frequency diminishes as the north pole is approached.

AURUNG'ABAD, or *Throne-town,* the name of at least four places in India. The most important is in the territory of the Nizam, situated on the Doodna, a tributary of the Godavery. The pop. is estimated at about 60,000. Its monuments of former grandeur are a palace, now in ruins, built by Aurungzebe, and the mausoleum of Aurungzebe's daughter.

AURUNGZEBE' (properly, Aurangzíb, "ornament of the throne") was the most powerful of the great Moguls, the last who ruled with energy and effect. He was b. on the 23d Oct., 1618, and was 10 years old when, his grandfather dying, his father, Shah-Jehan, ascended the throne. A. early aspired to wield the rod of empire, but he craftily hid his designs beneath the cloak of piety. In 1657, his father, who had previously promoted him to high civil and military offices in the state, in performing the duties of which he greatly distinguished himself, was seized with an illness from which he was not expected to recover. The reins of power were at once seized by his eldest son, Dára, who treated his brothers very arbitrarily—Shujá at that time being governor of Bengal, A. of the Deccan, and Murad of Guzerat. The first immediately took up arms. A.'s policy was

* Arctic voyagers, such as Parry and Franklin, throw doubt on the existence of any such noise, for not one of the numerous and brilliant auroras seen by them was ever attended with the faintest sound.

to let the two fight it out, and exhaust each other, and then to play off his third brother against the victor. He conferred with Múrad; assured him he had no earthly ambition; that the crown he strove for was a spiritual, and not a temporal one; and that, for affection's sake, and with a view to promote the interests of the true faith—Dára was liberal in his religious opinions, and had written a book to prove that Mohammed and Brahma agreed in all essential points—he would support his pretensions to the throne. Múrad believed him, and the forces of the two were joined. Meanwhile, Dára having overcome Shujá's army, directed his forces against his other two brothers; but A.'s plausibility prevailed over Dára's generals, who deserted, and Dára had to seek safety in flight. By this time, however, Shah-Jehan had somewhat recovered. A. professed the utmost loyalty, but secretly gave his son instructions to take possession of Shah-Jehan's palace, which was done, and the aged monarch was made prisoner. A. next seized and confined his too confiding brother, Múrad; and after a struggle of two or three years' duration, Dára and Shujá also fell into his power, and all three were put to death. The scepter was now firmly within the grasp of Aurungzebe. He professed not to care for the imperial insignia, but was ultimately induced to receive them on Aug. 2, 1678. He, at the same time, assumed the presumptuous title of Alemgír, "conqueror of the world." He also took the title of Mohi-eddín, "the reviver of religion." In the seventh year of A.'s reign, his father died, at a good old age; but there are suspicions, nevertheless, that his death was hastened by slow poison, administered by command of his son.

A.'s long reign of half a century was distinguished by great outward prosperity; but the empire was diseased at its heart. Everywhere there was distrust; A., who had established his empire by fraud, was naturally enough distrusted by all. He lacked confidence in his statesmen, who, in their turn, distrusted him and one another. His sons imitated him in his disobedience to his father, and the Hindoos, whom he treated with great harshness, excited the Mahrattas against him in the s. Still his great abilities sufficed during his reign not only to preserve his empire in tact, but even to enlarge it considerably. Discord between the monarchs of Bíjapur and Golconda, which was mainly due to his policy when acting as governor of the Deccan, enabled him to add these two kingdoms to his empire. But the seeds of decay which had been sown in his reign bore ample fruit in the reign of his son. The decadence of the Mogul empire dates from A.'s death, which took place at Ahmednuggur, on the 21st Feb., 1707, in the 89th year of his age, and 50th of his reign. The latter years of A.'s life were passed in misery. The memory of his own crimes weighed heavy on his soul. He lived in constant dread that he himself would receive of the measure which he had meted out to others. His court was remarkable among oriental courts for its economy and freedom from ostentation. A.'s character was not without its good features, as instanced by the fact, that in the third year of his reign, when there was a great famine in the land, he gave unreservedly the funds of his treasury, which had been greatly augmented by his frugality, to procure food for his people.

AU SABLE, a t. and village in Clinton co., N. Y., on the A. S. river, 7 m. from lake Champlain; pop. of township, '70, 2863. In the vicinity of the village is a great chasm or gorge, much visited by tourists.

AUSCULTATION (Lat. *auscultо*, to listen), a mode of detecting diseases, especially those of the heart and lungs, by listening to the sounds produced in the cavity of the chest. This is done either by the unassisted ear (*immediate* A.), or by the aid of a simple sound-conveying instrument, the stethoscope (q.v.) (*mediate* A.). By care and attention, the normal sounds produced by respiration and the beating of the heart may be distinguished from the several abnormal sounds indicating disease. A. is classed among the most important of discoveries in modern medical science. Its details are ably explained by the discoverer, Laënnec. See PERCUSSION.

AU'SONES, a tribe of unknown origin in ancient Italy, said in tradition to be descended from Auson, a son of Ulysses and Calypso. They gave the name Ausonia to southern Italy, afterwards called Magna Græcia. Niebuhr supposes they were of the Oscan nation.

AUSO'NIUS, DECIUS MAGNUS, the most conspicuous Roman poet in the 4th c. after Christ, was b. at Burdegala (Bordeaux), about 309 A.D. Scaliger asserts that his father, Julius A., was the favorite physician of the emperor Valentinian, but the assertion has no historic basis, so far as we know. He was, however, a man of considerable importance, having been at one time honorary prefect of Illyricum, and he appears to have taken care that the young A. should receive an excellent education. Many amiable female relatives fostered, and probably flattered the talents of the boy. After finishing his curriculum at Toulouse, he returned to Bordeaux, where, after practicing for a short time at the bar, he turned his attention to literature, and soon distinguished himself as a professor of oratory. Some years later, he was appointed by Valentinian tutor to his son Gratian; afterwards quæstor, and, by Gratian, prefect of Latium, and subsequently consul of Gaul (379 A.D.). On the death of Gratian, A. retired from public life to his estate at Bordeaux, where he occupied himself with literature and rural pursuits until the time of his death (392 A.D.). The question whether or not A. was a "Christian," has occasioned much controversy, and remains yet unsettled. His works include translations of Greek eclogues, a collection of 150 epigrams, epistles in verse and prose, 20 so-called

idyls and other descriptive pieces, which, though admired in their day, are generally worthless, and bear all the marks of the corrupted taste prevalent in literature during his time. But though destitute of every true poetic quality, A. occasionally displays a certain neatness and grace of expression, which show that, in a better era, he might have proved a greater poet. Besides these, he also wrote a panegyric on the emperor Gratian, full of bombastic phrases and fulsome adulation. Editions of his writings have been given by Scaliger (Leyden, 1575), Tollius (Amsterdam, 1669–1671), and Souchay (Paris, 1730).

AUS'SIG, AUSSYENAD, or LABEN, a t. of Bohemia, at the junction of the Elbe and the Bela, 44 m. n.n.w. of Prague; pop. '69, 10,933. In 1426 A. was destroyed by the Hussites, and in 1639 was seized by Sweden. There is a church here which, it is claimed, was begun in 826, containing a "Madonna" by Carlo Dolce. The trade of A. is in coal, fruits, mineral waters, and timber.

AUSTEN, JANE, a novelist of deservedly high reputation. Her father was rector of Steventon, Hampshire, at which place his daughter was b., Dec. 16, 1775. Mr. Austen, who was himself a gentleman of some literary attainments, bestowed on his daughter an education superior to that usually given to young ladies in her sphere of life in the end of last century. Jane was distinguished alike by good sense, sweetness of disposition, and personal attractions. Her novels, which are rather limited in subject, are remarkable for the truthfulness with which they portray the everyday life of the middle classes of England in her time, and for their delicate, yet withal distinct discrimination of the various shades and peculiarities of character. Sir Walter Scott said of her: "That young lady had a talent for describing the involvements, feelings, and characters of ordinary life which is to me the most wonderful I have ever met with. The big bow-wow I can do myself like any one going; but the exquisite touch, which renders common-place things and characters interesting from the truth of the description and the sentiment, is denied to me." Miss A.'s first four novels—*Sense and Sensibility, Pride and Prejudice, Mansfield Park,* and *Emma*—were published anonymously between 1811 and 1816. *Northanger Abbey* and *Persuasion* followed, with her name on the title-page, in 1818, after her death, which took place at Winchester, July 24, 1817.

AUSTEN, WILLIAM, an English metal-worker and designer of the 15th c., celebrated as the constructor of the famous tomb of Richard de Beauchamp, earl of Warwick, in St. Mary's church, Warwickshire. Men of taste and judgment have not hesitated to put his works on an equality with those of Italian artists of the same period.

AUSTERLITZ, a small t. in Moravia, about 12 m. e.s.e. from the t. of Brünn, stands on the Littawa, and has a pop. of 3800. A. has a handsome palace; but it is celebrated chiefly as the place where Napoleon I., in Dec., 1805, defeated the combined forces of Austria and Russia, under the command of their respective emperors. After the capitulation of Mack, at Ulm, Oct. 17, Napoleon had marched on without opposition to Vienna, of which he took possession Nov. 11, 1805. The Russian and Austrian forces had retreated to Moravia, and Napoleon had fixed his head-quarters at Brünn. Towards this locality the troops of Alexander and Francis marched in five parallel columns to offer battle. The movements of the allies were ill-conducted, and evidently made without a due knowledge of the strength of the French army, which was concealed by the tactics of Napoleon. It amounted to about 80,000 men; while the allied armies numbered 84,000, of which 16,000 were cavalry. The battle commenced at seven, on the morning of Dec. 2, and the Russian line was soon broken. The left wing of the allies suffered severely towards the close of the engagement, and endeavored to save themselves by crossing a frozen lake; but Napoleon ordered his artillery to fire upon the ice, which was broken up, and about 2000 perished in the water. According to Alison, the allies lost 30,000 in killed, wounded, and prisoners, and the French 12,000. Russian and French accounts make their respective losses smaller. The battle was followed by an armistice, the terms of which were dictated by Napoleon; and immediately after, on the 26th of Dec., by the treaty of Presburg, which determined that Austria should surrender the Venetian territories, and also her possessions in Swabia and the Tyrol.

AUSTIN, a co. in s.e. Texas, on both sides of the Brazos; traversed by the Houston and Texas Central railroad; 1024 sq.m.; pop. '70, 15,087—6574 colored. Timber and stock-raising are the chief resources. Co. seat, Bellville.

AUS'TIN, the capital of Texas, lies on the left bank of the Colorado, 200 m. from its mouth, in lat. 30° 15′ n., long. 97° 47′ w. In winter, A. is accessible to steamboats from the sea. Pop. '70, 4428.

AUSTIN, JOHN, a distinguished writer on jurisprudence, was b. on Mar. 3, 1790. At the age of 16, he entered the army, and served as a subaltern with his regiment in Sicily. But he left the service after the peace, and in 1818 was called to the bar. In 1820, he married Miss Sarah Taylor, of Norwich (see AUSTIN, SARAH), to whom he had been attached for many years, and went to live in Queen square, Westminster, next door to Jeremy Bentham and Mr. James Mill. In their society, his attention was naturally turned to the subjects he afterwards cultivated with success. He was compelled by bad health to abandon his practice at the bar, about the time when the university of London

was founded, and he then received the appointment of professor of jurisprudence. To fit himself for the chair, in the autumn of 1827 he settled at Bonn, then the residence of Niebuhr, Brandis, Schlegel, Arndt, Welcker, and Mackeldey, and he remained there throughout the winter. He returned to England well acquainted with the writings of some of the most eminent of the continental jurists. His lectures were well received by a few distinguished men; but the subject was not recognized as a necessary branch of legal study, and evidently did not supply that kind of knowledge best calculated to promote practical success in the legal professions. A. believed the position of a German professor of law to be the most enviable in the world; and with a small but sure income, he would have devoted his great powers to the exclusive cultivation of the subjects discussed in his lectures. But, unfortunately, no provision was made for the chair of jurisprudence beyond class fees, and in the absence of students, A., in 1832, was reluctantly compelled to resign his appointment. In the same year, he published his *Province of Jurisprudence Determined*, a work, at the time, little appreciated by the general public, and the small success it met did not encourage him to undertake other publications on the allied subjects. In the estimation of competent judges, however, it placed its author in the highest rank among writers on jurisprudence. In 1833, he was appointed by lord Brougham a member of the criminal law commission. The post was not much to his taste, as he did not believe that the public received any advantage from such bodies, in the efficacy of which for constructive purposes he put no faith. "If they would give me £200 a year," he said, "for two years, I would shut myself up in a garret, and at the end of that time I would produce a complete map of the whole field of crime and a draft of a criminal code." These, he thought, a commission might with some profit revise and amend. A. was afterwards appointed a member of a commission to inquire into the grievances of the Maltese. He returned to England in 1838, not in good health, and was advised to try the springs at Carlsbad. During his stay in Bonn he had been delighted with the respect the Germans manifest for knowledge, their freedom of thought, and the simplicity of their habits. With his slender means, decent existence in England was scarcely possible, and he removed with his family to Germany, living at Carlsbad in summer, at Dresden and Berlin in winter. The revolution of 1848 drove him back to England, and he then settled at Weybridge, where he d. in Dec., 1859, universally respected for the dignity and magnanimity of his character. His lectures on the principles of jurisprudence had remained in manuscript and imperfect. Since his death they have been prepared for the press by his widow, and published between 1861 and 1863, under the title of *Lectures on Jurisprudence, being a Sequel to "The Province of Jurisprudence Determined," etc.* On this work his fame now rests.

A.'s great merit consists in his having been the first English writer who attached precise and intelligible meaning to the terms which denote the leading conceptions underlying all systems of jurisprudence. With a very perfect knowledge of the methods of Roman and English law, he displayed genius of the highest order in devising a novel system of classification for the subject-matter of his science. The work he did is incomplete, but it forms a sure foundation to future laborers in the same field. It is universally recognized as an enduring monument of learning and genius, and it entitles its author to take rank with Hobbes and Bentham, as one of the three Englishmen who have made contributions of importance to the philosophical study of law. A. said of himself that his special vocation was that of "untying knots"—intellectual knots; and it was so. He set himself to the task of exposing the errors hid under the phrases and metaphors current among writers on law, and this he accomplished with such skill and subtlety as to make his works models of close and sound reasoning. In education, they now perform a most important part—that of disciplining the mind of those who devote themselves to the study of law and of the mental sciences generally in the difficult art of precise thought; and in this way they exercise an influence it is scarcely possible to overestimate on the rising generation of lawyers, publicists, and statesmen.—See Memoir of A. prefixed to the *Lectures on Jurisprudence*, and an article on A. in J. S. Mill's *Dissertations and Discussions*.

AUSTIN, Jonathan Loring, 1748–1826. He was b. in Boston, a graduate of Harvard, joined in the revolution, and was secretary of the Massachusetts board of war. In 1777, he was one of the commissioners sent to Paris to announce the capture of Burgoyne. Franklin employed him as an agent in England, and on his return in 1779, he was rewarded by congress. The next year he sailed for Spain as agent of the colonies, but was captured and taken to England, though soon afterwards liberated. He was secretary and treasurer of the new state of Massachusetts.

AUSTIN, Moses, d. 1821; a Connecticut pioneer in Texas. He took his family to the west in 1798, and from 1800 to 1820 was engaged chiefly in lead-mining. While at Bexar, Texas, he got permission from the Mexican commandant to colonize 300 families, and soon began the work, which was more fully carried out by his son.

AUSTIN, Samuel, D.D., 1760–1830; b. Conn.; a Congregational clergyman, who graduated at Yale; studied theology, and was ordained in 1786 as pastor of a church at Fairhaven. In 1790, he took charge of the First church in Worcester, Mass., and in 1795 was chosen president of the university of Vermont, where he remained six years. He

returned to Worcester in 1825. In the closing years of his life he was slightly deranged. He published several religious works.

AUSTIN, Mrs. SARAH, wife of John Austin, is well known as the translator of many of the best contemporary French and German works. She belonged to the Taylors of Norwich, a family remarkable for the men and women it has produced distinguished by literary and scientific ability. A faithful and devoted wife, she spent a great many years with her husband abroad, and she enjoyed the friendship of many of the most eminent persons in continental society. Mrs. A. translated from the German, *Characteristics of Goethe*, by Falk, etc., with notes (1833); *Fragments from the German Prose Writers*, with notes (1841); and *The Story without an End*, by F. W. Carove (several editions). She also translated from the German, Ranke's *Popes of Rome* and his *History of Germany during the Reformation*. Such is the excellence of these works, that they have been commended by the best judges as deserving to retain a place in English historical literature. Mrs. A. translated from the French, M. Cousin's *Report on Public Education in Prussia* (1834), and M. Guizot's work on *The English Revolution* (1850). She published in 1839 a work *On National Education;* and in 1857, *Letters on Girls' Schools and on the Training of Working-women*. From 1861 to 1863, she was engaged in editing her husband's lectures from his manuscripts, a duty she discharged with very great ability. She d. at Weybridge, on the 8th of Aug., 1867.

AUSTIN, STEPHEN F., d. Dec., 1836; son of Moses, and head of the Texan colony founded by his father. The colony occupied the site of the present city of Austin. Though much annoyed by Indians, he made it successful, and it received many accessions until the Americans became so numerous that they held a convention in Mar., 1833, to form a government for themselves. Without heeding the Spanish population, they agreed upon a plan, and A. took it to Mexico to receive its ratification, but there were so many revolutions on foot that he did not get a hearing. Then he sent a letter to Texas, recommending the Americans to unite all the settlements and municipalities and organize a state. This cost him three months' imprisonment, and longer surveillance; but in 1835 he returned to Texas and took command of the small revolutionary army. He induced Sam Houston to take the chief command, while A. went as commissioner to the United States, and prepared the popular mind to receive the new republic of the lone star. Before his mission was successful he returned to Texas, where he died.

AUSTIN, WILLIAM (or BILLY); the half-witted boy of Deptford who was reputed to be the son of queen Caroline; though she was legally acquitted of the charge, she kept him near her. In 1830, he was sent to a lunatic asylum in Milan, and came back to England in 1845. After a medical examination, at the request of his guardian, he was ordered to a private asylum in London.

AUSTRALASIA, a term etymologically equivalent to *Southern Asia*, but according to usage different. While *Southern Asia* vaguely means the lower regions of that continent, A. definitely indicates those large, or comparatively large, islands which, lying between the Malayan or Indian archipelago and Polynesia proper, are at once rounded off in collective position from the former, and distinguished in individual magnitude from the latter. The islands in question are chiefly Papua or New Guinea, Australia, Tasmania, New Zealand, New Caledonia, New Hebrides, New Ireland, and New Britain—all to be again noticed in their places. Though the name is not in general use, yet it seems necessary to a satisfactory system of geographical classification. In its entire extent, A. cannot be much less than Europe.

AUSTRALIA, the s.w. division of Australasia. By some, it is strictly defined to be an island—as, indeed, may either of the masses of land called the old and the new worlds—while by others it is loosely described as a continent. It is bounded on the w. by the Indian ocean; on the n., by Torres strait; on the e., by the Pacific; and on the s., by Bass's strait. It extends in s. lat. from 10° to 39°, and in e. long. from 113° to 154°; while its longest dimensions, as incidentally noticed under the head of AMERICA, may be said to run respectively on a meridian and a parallel. The parallel in question is that of about 25°, nearly the mean lat. of A.; and the meridian is that of 142° or 143°, nearly the mean long. of Australasia—a meridian, too, which, when produced in either direction, seems to mark out both Tasmania and Papua as geological continuations of Australia. In English measure, the greatest breadth from n. to s. is upwards of 2000, and the greatest length from e. to w. nearly 2600 miles. Of the resulting rectangle of 5,205 000 sq.m., A. comprises more than a half, perhaps four sevenths, or, in all, about 2,970,000 sq.m.—half the area of South America, as the next larger continent, or ten times that of Borneo, as the next smaller island.

In the mutual relations of itself and the ocean—a point of vast importance to so large a mass of land—A. is decidedly inferior to every one of the grand divisions of the globe. It is not indented by the sea, as is North America on the e., or Asia on the e. and s., or Europe on all sides but one. Again, as to navigable channels between the coast and the interior, A. is not to be compared even to Africa with its Nile and its Zambezi, its Niger and its Congo, its Gambia and its Senegal, and its many smaller arteries of communication besides.

Among the indentations of the coast, the gulf of Carpentaria, on the n.e., the only one of considerable magnitude, does, it is true, penetrate inwards about 500 m. from

cape York on the e., and about 400 from cape Arnhem on the west. This opening is entirely surrounded by tropical regions, rendered suitable for colonization by the frequent and moderate rains. In connection with the construction of the overland electric telegraph from Adelaide, through the heart of the continent, to Port Darwin on the gulf of Carpentaria, distant 2000 m.—effected by the government of South Australia, and opened in 1872—settlements have taken place in territories very different from what earlier observations seemed to indicate. For, saving the desert lying in the center in lat. 27° to 25° s., the interior of Australia is found to be covered with soil more or less fertile, in which, except during periodical droughts, that sometimes reduce the surface to a condition not unlike that of a beaten road, the rain-fall is sufficient to revive the dormant germs of vegetable life, and to clothe the country with grass; while, occasionally, the fall of rain is so great as to transform the whole of a plain, as far as is visible, into a sea, on the disappearance of which, in a wonderfully short time, the ground becomes covered with verdure. The other inlets put together are scarcely equal in size to the gulf of Carpentaria alone; while, strictly speaking, most of them are rather mere bends in the coast-line than actual arms of the ocean. Of the secondary inlets, the two that cut deepest into the land are the gulf of St. Vincent and Spencer gulf, in the south. Of harbors, properly socalled, there is a remarkable deficiency; and this deficiency is all the more important from the dangerous character of the reef-girt shores. As to fluvial communications between the coast and the interior, they can, with a single exception, hardly be said to exist at all. The interior and the coast are alike unfavorable to the production and maintenance of regular and permanent streams. The interior—comprising the whole mass within a border of not more than 100 m. in average width, and representing, in proportional size, the plate of a mirror with the scantiest possible breadth of frame round it—sends, as a general rule, hardly any tribute to the ocean. So far from possessing any reservoirs for the supply of rivers, its only large body of water, the brackish pool or salt marsh, according to circumstances, of lake Torrens (q.v.), is the landlocked receptacle of at least one of its principal streams. With the single exception of the Murray, and perhaps its southern affluents, even such inland water-courses as do conduct their surplus to the sea, lose each a large proportion of its volume through evaporation and absorption. With regard to the coast streams, again, the mountains, which form the dividing ridge, being, in general, only about 100 m. from the sea, the streams are for the most part, from their shortness, of comparatively insignificant size. This is more peculiarly the case on the s.—for the Murray, as flowing from the inner slope of the maritime ridge, is no exception to the general rule. To the w. of the Glenelg, which empties itself into the Southern ocean, between capes Northumberland and Bridgewater, the coast yields not a single river worthy of the name; while the entire line between Streaky bay and cape Arid—a stretch of 10° of long. on the Great Australian Bight—pours, incredible as it may seem, not a single drop of fresh water into the Southern ocean.

But the poverty of Australian hydrography is aggravated by the singularities of the so-styled "weatherology." An alternation of more or less rainless and rainy periods is characteristic of the Australian skies. The rivers undergo a similar alternation of drought and flood, the one state being, within certain limits, almost as destructive as the other. Even in these inequalities there is great irregularity. During the period of drought, a river presents a succession of phases—a scanty, though still regular stream; nearly stagnant ponds with a connecting thread of water between them; detached "water holes" in all the gradations of a constantly decreasing depth; moist pits that may yield their buried treasure to the spade; and, lastly, parched hollows where the labor of digging may be expended in vain. In the drought, for instance, from July, 1838, to Aug., 1839—during which "not a drop of rain fell in Sydney"—even the Murray, generally described as the only permanent river of any magnitude in the country, dwindled away into a chain of pools; and a recent explorer in western A. found on the bed of a large river—an *affluent*, if it may be so called, of the thoroughly broiled and baked Murchison—the indubitable footprints, then 3 years old, of preceding explorers. The flood, again, varies as widely, if not so definitely and gradually, as the drought. To select what may be regarded as an average instance from a list of the floods of the Hawkesbury in New South Wales: the torrent, at the end of July and beginning of Aug., 1808, rose to a height of 86 ft., or fully 50 above the edge of the bank, destroying the uncut crops of the settlement, and sweeping away stacks of wheat and great quantities of stock of every description. More than 60 such visitations appear to have been ascertained and recorded within the historical period, now extending over 80 years, of which about a third occurred in winter, the remainder being distributed in not very unequal proportions between spring, summer, and autumn, and that without the exemption of any one of the twelve months of the year.

The rivers of the e. coast—the Brisbane, Richmond, Clarence, Macleay, Hastings, Manning, Hunter, Hawkesbury, and Shoalhaven—are, in general, towards their mouths, tidal streams, flowing between high banks through a comparatively level region. Some of those of Victoria—such as the Glenelg—spring from a moist and undulating tract of country; while most of the others rise among the lofty ranges and snowy peaks of the Australian Alps—the coldest section of the bordering mountains by reason both of their altitude and of their distance from the equator. They are subject to frequent freshets in winter, and are less eccentric than the other rivers of A. in general. To the w. of

the Glenelg, as stated above, rivers may be said almost to disappear. South A. possesses only a few inconsiderable streams, and a number of usually dry torrent-courses; and as to the Great Bight, still further to the w., more than 500 m. of the coast have been already characterized as utterly waterless. To the w., again, of cape Arid, the coast presents only a few small lakes and inconsiderable water-courses, but nothing worthy of the name of river. On the w. side of A., the Swan river is by far the largest of the water-courses. Generally speaking, the whole of them are fed almost solely by the winter rains, many of them, during the dry season, either disappearing through a great part of their course, or dwindling into a series of detached pools. Along the remainder of the w. coast, no rivers worth notice have yet been discovered. Nor yet along the n.w. have any been found, excepting a few small ones towards Cambridge gulf. The rivers of this neighborhood much resemble in character those of the opposite angle in the colony of Victoria. They rise at no very great distance from the sea. Near their sources they are mere torrents; but in the lowlands their generally slow currents wind through fertile plains and valleys, which are subject to sudden and terrific inundations. In North A. are several comparatively considerable rivers—the Victoria, the Flinders, the Roper, and the Albert. They are wide streams, rising in the elevated region of the interior, and traversing a rugged country, which is often flooded. Lastly, along the n.e., the streams are distinguished by their length, a distinction which they owe to their being parallel with the coast. They are the Mitchell, Lynd, Burdekon, Mackenzie, Dawson, Fitzroy, Belyando, etc.; the whole of them, with the exception of the two last named, having been discovered by Dr. Leichhardt. To pass from the rivers of the coast to those of the interior, we must confine ourselves to two of the latter—Barcoo or Victoria, and the Murray with its numerous tributaries. The upper part of the Barcoo was first discovered by Sir T. Mitchell, in a broken district, lying 300 or 400 m. from the e. coast, and nearly on the tropic of Capricorn. Its broad reaches might there have floated a steamer. Since then, it has been traced by Mr. Gregory through a solitary course into lake Torrens, though, in point of fact, it is only from time to time that it actually has a surplus to pour into its receptacle. The system, again, of the Murray and its tributaries is vastly more complex. Rising on the w. or inner slope of the Australian Alps, it flows to the w.n.w. with a plentiful stream, which alone in the country, after the fashion of a tropical river, rises and falls regularly according to the season; and, though inacessible to ships of any size from the sea, it has an internal navigation of about 2000 m. in length. On its left or southern side, it receives several considerable streams, such as the Ovens and the Goulburn. But it is on the right or northern side that the basin of the Murray is most peculiar. The principal affluents in this direction are the Murrumbidgee and the Darling. The Murrumbidgee, to which the Lachlan, only less "mysterious" than the Darling, contributes such surplus as it from time to time may have, forms the chief strand of a complicated net-work of water-courses. The Darling, after it has received all its tributaries, pursues its lonely way for 660 m., sending off branch after branch to lose themselves in landlocked lagoons. Nor is its growth less curious than its lower channel. The whole of the interior drainage of the maritime ridge of New South Wales between lat. 25° and lat. 34°, a stretch of about 625 m., converges into a vast basin of clay, on the 30th parallel, where the Balonne, Dumaresque, Gwydir, Namoi, Castlereagh, Macquarie, and Bogan, after spreading out in spacious marshes, and amid complicated junctions and bifurcations, unite such surpluses as absorption and evaporation may have left them to form the "mysterious" Darling.

Such being the hydrography of A., the investigation of the interior, so far as it has hitherto advanced, has been conducted almost entirely by land. In 1844, Sturt penetrated to the center of the country, between Spencer gulf on the s., and the gulf of Carpentaria on the n., meeting sterility and drought. In 1847, Leichhardt, encouraged by the success of his previous expedition from Sydney to Port Essington, started from Moreton bay on the e., for western A., following a sort of diagonal of nearly the greatest possible length; and, as was to be dreaded, he must have failed in his bold enterprise; for neither of himself nor of his companions has any intelligence ever been received. Subsequent explorations made by Stuart (1858–62), Burke and Wills (1860–61), and by expeditions in search of them, have resulted in the discovery that this interior of the Australian continent is, on the whole, well fitted for pastoral, and, in many places, for agricultural purposes. See AUSTRALIAN EXPLORATIONS. Any detailed view of the climate, besides being equally difficult and unsatisfactory with respect to so vast an aggregate of latitudes and longitudes, has been rendered comparatively unnecessary by the incidental allusions to the subject in the preceding paragraphs. The following are tabular statements extracted from local publications:

MEAN ANNUAL RAIN-FALL.

Locality.	Latitude.	Rain-fall.
Brisbane, Queensland, lately Moreton bay	27° 1′	35.92 in.
Port Macquarie, New South Wales	31° 25′	70.79 "
Sydney, New South Wales	33° 51′	49.00 "
Port Phillip, Victoria Colony	38° 18′	29.16 "
Lake Alexandrina, mouth of the Murray	35°	17.45 "
Adelaide, South Australia	34° 55′	19.90 "
York, West Australia	31° 53′	25.39 "

FREQUENCY OF RAINY DAYS.

Month.	Adelaide.	Port Phillip.	Sydney, South Head.	Port Macquarie.
January	4	6	13	11
February	4	5	12	11
March	5	7	13	12
April	10	11	12	12
May	10	13	12	11
June	11	11	12	9
July	14	12	13	9
August	15	14	11	8
September	11	12	11	9
October	10	12	12	10
November	6	10	11	9
December	5	7	11	9
Whole year	105	120	143	120

The mean temperature of Melbourne is 59°, being about 9° higher than that of London. The warmest month is Jan., the mean of which is 68°; the coldest is July, 49°.34. The corresponding temperatures of London are 63° and 36°.

Geology.—The little that is yet known of the geology of A. has been chiefly obtained from occasional notes scattered through the journals of scientific travelers. So utterly unknown were the mineral treasures of this continent, that it was only comparatively lately, and by the merest accident, that the Burra Burra copper-mines were discovered. In 1851, farmers were turning up with the plow the auriferous alluvium; pebbles of gold-bearing quartz were used for garden-walks; and we have heard of an Oxford graduate who ornamented his garden-walls by building into them masses of white quartz variegated with portions of the unrecognized yellow metal. In 1846, when count Strelecki submitted to Sir R. Murchison a series of rock and mineral specimens gathered in southern A., the practiced eye of that veteran in geology recognized in them a remarkable resemblance to the rocks in the auriferous districts of the Ural mountains, which he had thoroughly explored. He could not ascertain that gold had ever been found in the colony, but so certain was he that the precious metal existed, that he printed and circulated amongst the miners of Cornwall a paper urging them to emigrate to New South Wales, and seek there for gold, as they had been accustomed to seek for tin and zinc among the alluvial débris of their own hills. After a few years, in the researches of Mr. Hargreaves, and the diggings that followed, this remarkable prediction was fulfilled to an extent that could not have been anticipated. This narrative is of much value, as showing that geology is no longer in the hands of empirics; that its truths have been so gathered and arranged as to afford bases for safe inductions; and that, when rightly used, this science is of the first importance, even when tested by the utilitarian *Cui bono?* of the age. Recognizing this, the colonial governments of A. have appointed state geologists, who have begun their examination of the Australian continent, and have published several reports.

In looking at the continent as a whole, it will require not many broad touches to convey all that is at present known. An immense, roughly quadrangular and comparatively flat district in central A., extending from the southern shores in lat 33° s., where it forms a coast-line of somewhat bold cliffs, to 18° s. lat., and having for its eastern and western limits 124° and 138° e. long., is composed of *tertiary* rocks. The superficial characteristics of this vast almost unpeopled tract have already been described. Nothing more is known regarding its structure. Three other patches of tertiary rocks exist. The largest is a broadish tract, which forms the coast of western A. northwards from the colony of Perth, as far as the tropic of Capricorn. The second occupies a considerable portion of the valley of the Murray river, in that district known as lower Darling. The last and smallest patch covers the southern slope of the Australian Alps, extending along the shore from Wilson's promontory to cape Howe.

The immense central expanse of tertiary beds is surrounded by a continuous belt of *plutonic and metamorphic rocks*, only broken on the southern shores, where it forms the coast-line, and where the sea has indented it, forming a bay which has for its boundaries the more enduring primitive rocks. This crystalline belt is, on its e., n., and western sides, separated from the sea by a tract of land having a nearly equal breadth of 100 m. throughout its course. Tracing this from its southern termination in western A., we find a limited region of palæozoic rocks occupying the colonized district around Perth, and containing valuable coal-beds. Northwards, as already indicated, the coast-line consists of tertiary rocks. From their termination in lat. 23½° s., the rocks along the whole western and northern shores are composed of secondary strata. On the eastern shore, from cape York to the western boundary of Victoria, the formations belong to one or other of the primary series. Through the whole extent of this boundary tract, whether consisting of tertiary, secondary, or primary strata, numerous and often extensive patches of igneous rocks exist which have been erupted during the tertiary or post-tertiary epochs.

About 100 m. from the bounding tract of palæozoic rocks on the eastern limits of A., and running parallel with it, there is an equally broad strip of similar strata extending from the shores of the gulf of Carpentaria to Bass's strait. These two regions, which unite together and are largely developed in the southern portion of Victoria, supply the great store of Australian mineral wealth. The veins which intersect these strata were the original matrices of the *gold*. It has not, to any extent, been sought for in this, its original position, from a belief that the amount of metal decreases as we descend in the solid rock. Mr. Selwyn, colonial geologist for Victoria, has, however, lately reported in favor of quarrying for the gold in the solid rock. The greatest amount of gold is found in the heaps of débris or old alluvium derived from the denudation of the old slaty rocks. The auriferous rocks of eastern A. are lower silurian, as shown by Messrs. Lonsdale and Salter, from the examination of specimens of pentameri, trilobites, and corals from the strata which overlie them. Mr. Selwyn has referred the Victoria gold-bearing strata to the same age, from the occurrence in them of about 60 species of lower silurian fossils, including trilobites, graptolites, and lingulæ. The auriferous quartzose veins are most abundant in the vicinity of eruptive rocks, whether granite, porphyry, or greenstone.

Messrs. Selwyn and Rosales have shown that the superficial drifts containing the gold consist of three distinct stages. The lowest or oldest contains the remains of wood and seed-vessels differing little from the present vegetation; among them the cones of banksia, an exclusively Australian genus, have been identified. The remains of animals exhibit also the representatives of the living fauna of the country. Gigantic marsupials then existed—kangaroos, potoroos, and wombats—representing the elephants, and even the large carnivora of Asia; but with the exception of the mastodon, of which one species has been found in A., there were, it would seem, no generic forms common to this great district and the rest of the land in the eastern hemisphere. In Victoria, these beds of alluvium have been overflowed and even interlaced by basaltic *coulées*, which evidently proceeded from terrestrial volcanoes, inasmuch as the vegetable matter beneath them has been charred and destroyed *in situ* by the eruption.

An extensive *coal-field* has been known for some time as occupying the whole of the great basin of the Hunter river and its tributaries, down to the sea-coast at Newcastle, where several beds crop out on the beach. For a good many years, the monopoly held by the Australian Agricultural Company, in the working of the coal, has ceased to exist, and as the result, the trade has increased enormously. From Port Hunter the coal is dispatched to all parts of A., and even to New Zealand and California. Beds belonging to the carboniferous system have been discovered also in western A., near Perth, and the coal has been successfully, though not so extensively wrought there.

After gold and coal, the next most important Australian mineral is *copper*. The Burra Burra mines, in South A., were discovered in 1842. The lode is 17 ft. wide, and of vast extent. The ore contains 75 per cent of metal, and is quarried out like stone in immense masses. Copper has also been wrought for several years at Bathurst, in New South Wales. The poorest ores are here most abundant, the rich pyrites existing only in small quantity. Copper is now mined and smelted in western Australia.

Iron is spread in great profusion over all the continent. To such an extent does it exist in several of the mountains on the north coast, that they violently affect the magnetic needle. At Berrima, in New South Wales, an oxidulated iron ore, from which is manufactured a good steel, has been worked, but not successfully. Iron has been noticed in quantity in both southern and western Australia.

Lead is most abundant e. and s.e. from Adelaide, at Mt. Beevor, and near cape Jervis. The ore of Glen Osmond mines, near Adelaide, yields 75 per cent of lead, besides a proportion of silver. This metal is also wrought at Geraldine, in western Australia.

Manganese, bismuth, tin, and antimony have been met with in South A., as also good specimens of jasper, chalcedony, and opal.

Zinc and quicksilver are mentioned as occurring in western Australia.

Botany and Zoology.—The natural history of A. is remarkably different from that of any other quarter of the globe. Its trees—which seldom form dense forests, but are scattered as in a lawn or park, where the colonist finds pasture for his flocks without any previous clearing—are, almost without exception, of very peculiar appearance. Among the largest of them are species of *eucalyptus* (q.v.), some of which attain the height of 150 or 200 ft., rising without branches to at least half their height, their stately stems resembling beautiful columns. Some of the eucalypti, on account of their resinous exudations, are known to the colonists as gum-trees. Their leaves are leathery. It is, indeed, a general characteristic of the trees and shrubs of A., that their leaves are evergreen and of a firm texture; and although in this a beautiful adaptation may be perceived to the prevailing dryness of the climate, the foliage wants the delicacy and the liveliness of tints which in other countries form so much the charm of the landscape. The *casuarinæ* (see CASUARINA) or cassowary-trees (beef-wood, she-oak, swamp-oak, etc.), among which, as among the *eucalypti*, are some of the largest and most useful timber-trees, are still more singular in appearance; their long, wiry, jointed branchlets, which greatly resemble those of *equiseta*, are quite leafless, having only very small sheaths instead of leaves. Equally destitute of foliage are the greater number of the *acacias* (q.v.), which abound in the Australian flora. The abundance of *proteaceæ*—

which order includes the genus *banksia*, already noticed in the geology—connects the flora of A. with that of the cape of Good Hope, to which there are also other points of resemblance; and although true heaths do not appear, their place is supplied by a variety of heath-like plants of other natural orders, and particularly of the order *epacridaceæ*, of which some (of the genus *epacris*) now take their place with heaths among the favorite ornaments of our greenhouses. *Araucarias* (q.v.) form a connecting link between the flora of A. and that of Chili. In the more northern parts, palms and other tropical productions connect it in like manner with that of the s.e. of Asia.

Few of the trees or shrubs of A. produce edible fruits, and those known as Tasmanian currants, Tasmanian cranberries, etc., are not of much value. The seeds of the araucarias are edible, having some resemblance to almonds. Almost none of the native vegetable productions of A. have been found worthy of the care of the gardener, except as objects of beauty or curiosity; and it produces no plant which has yet found its way, or seems in the least degree likely to find its way, into agriculture—unless, indeed, some of its pasture plants may prove to be peculiarly adapted to dry climates. But the cultivated plants of other countries have been introduced with great success by the colonists, and their gardens boast not only of the fruits common in England and the south of Europe, but of some of those of China.

The zoology of A. is particularly characterized by the prevalence of marsupial (q.v.) quadrupeds, of which comparatively few exist in any other part of the world. Some of them are herbivorous, as the kangaroos (q.v.), potoroos (q.v.), and wombats (q.v.); some feed indifferently on roots and insects, as the bandicoots (q.v.); some are carnivorous, as the thylacine (q.v.) and the dasyure (q.v.)—the *tiger* and the *wild cat* of the colonists—but all are marsupial; that is, the females have a pouch for the young, which are born in a much less advanced state than the young of other viviparous animals. Besides its marsupial quadrupeds, A. has few others, yet known, except some species of bat; a kind of dog, known as the dingo (q.v.); and the *echidnas* (q.v.) and duck-bills (*ornithorhynchus*) (q.v.), animals which have been regarded as forming a connecting link between quadrupeds and birds, both upon account of external form and anatomical structure, and to which nothing at all similar exists in any other part of the world.

Many of the birds of A. are very beautiful, but they do not exhibit peculiarities so general and striking as its quadrupeds, or even its plants. The emu (q.v.) may be regarded as the Australian representative of the ostrich and cassowary. The black swan is chiefly remarkable for its color. Ducks of various kinds, falcons, doves, parrots, and many other birds of families well known elsewhere, connect the natural history of this isolated continent with that of the other regions of the globe.—Reptiles are numerous, but exhibit as a class no very marked peculiarities, nor is there in any other department of zoology so wide a difference from the rest of the world as in the mammalia. Among the fish of the Australian shores and rivers are many species which are not found elsewhere, but they present no remarkable common characteristic. Among them are no trouts, salmon, or other *salmonidæ*, which, indeed, do not extend into the southern hemisphere. Attempts to export ova to A., and colonize her waters with salmon, have not been successful.

As to the cultivated productions, wool may be reckoned the grand staple of Australia. For sheep-farming, the country, so far as it is not a desert, seems to be admirably adapted. The colonist, instead of having, as in America, to hew his way through dense forests, with tangled underwood, sees around him either open pastures or park-like woods overshadowing their green sward. His main difficulty is the scarcity of water, or rather the possibility that such a scarcity may occur. Wheat is grown to advantage, particularly in South Australia; cotton, tobacco, and sugar are produced in New South Wales and Queensland; the vine is grown extensively by the colonists, who have begun to avail themselves of the capabilities of the respective colonies by rearing the productions of tropical and temperate climates, both of which are possessed by Australia.

History.—In 1606 the north coast was descried by the Dutch on board of the *Duyfen*, and about the same time by a Spanish expedition sent from Peru in 1605, one of the commanders of which gave his name to Torres Straits. It is probable, however, that A. had been long known to the Chinese. In 1619 and 1622 respectively, the west and south-west coasts were seen. In 1642 the island, called for some time Van Diemen's Land, but now Tasmania, was visited by Tasman, who, within a month, sighted also New Zealand. In 1697, Swan river was discovered by Vlaming. In 1770 Cook, then on his first voyage, explored nearly the whole of the east coast, designating the same New South Wales. In 1798 Bass, a surgeon in the navy, ascertained the separation of A. and Tasmania, by passing through the strait that bears his name. In 1802 Port Phillip was entered; and in the same year, Flinders pretty nearly completed the general outline by sailing along the southern shore. To pass from discovery to colonization: there was established, in 1788, the settlement of New South Wales, and from this all the other British Australian settlements, with the exception of Swan river, have successively been planted. Norfolk island, erected, in 1790, into a penal settlement for New South Wales, was in 1856 allotted to the descendants of the mutineers of the *Bounty*, most of whom were removed for this purpose from Pitcairn's island. The other colonies, whether offshoots or not of New South Wales, assumed an independent existence in the following order: Tasmania, 1825; Western A. or Swan river, 1829; South A., 1834; New Zealand, 1841; Victoria,

1851; and, lastly, Queensland or Moreton bay, 1859 (see these heads). Besides these flourishing colonies, a settlement was established near Port Essington in 1839, but was abandoned in 1845, on account of the unhealthiness of the climate. Subjoined is a summary table of statistics for all the more important of these dependencies, not including those incipient settlements that have been effected along the course, and at the terminus, of the overland line of telegraph.

COLONIES.	Square miles.	Pop. 1871.	Exports. 1871.	Imports. 1871.	Wool. 1871.	Gold. 1871.	Copper 1871.	Land under cultivation. 1874.	Pub. rev. 1875.	Pub. debt. 1875.
			£	£	Lbs.	Oz.	Cwts.	Acres.	£	£
New S'h Wales	323,437	503,981	11,245,032	9,609,451	65,503,306	296,928	13,340	464,957	4,121,996	11,470,637
Victoria.....	88,198	730,198	14,557,820	12,341,995	76,334,480	1,647,389	.....	1,011,799	4,406,906	12,485,432
S'th Australia.	760,000	185,626	3,582,397	2,138,022	24,061,560	.....	127,911	1,330,484	1,055,936	2,937,350
Queensland....	678,600	120,104	1,539,968	2,434,480	517,515	100,634	.....	64,218	1,261,464	5,252,286
W'n Australia.	978,000	25,353	199,280	198,010	83,976	.....	.....	45,292	157,775	.....
Tasmania.....	26,215	99,328	740,638	778,087	298,160	.....	.....	326,486	343,676	1,489,400
New Zealand..	102,000	256,260	5,282,084	4,078,193	1,986,996	750,029	.....	1,943,667	2,735,956	12,897,185
Totals.....	2,956,450	1,920,850	37,147,219	31,598,238	168,785,993	2,774,980	141,251	5,186,903	14,083,709	47,533,290

The native population of A. belongs to the race or group of tribes variously designated as *negritos, Austral negroes,* or *kelænonesians* ("black islanders"). The chief members of the group, besides the Australians, are the papuans of New Guinea, New Caledonia, and New Hebrides, and the natives of Tasmania. See ETHNOLOGY, NEGRITOS. The Tasmanians are now extinct, and the Australians are rapidly diminishing in number; their condition will be considered under the head of each colony. In Victoria they still number 1330 (not included in the foregoing table). The 38,540 natives of New Zealand (also not included in the table) belong to the Polynesians (q.v.).

AUSTRALIAN EXPLORATIONS. Since the article AUSTRALIA in the first issue of the *Encyclopædia* was written, additional information collected by various exploring expeditions has largely modified the opinion formerly entertained with regard to its interior. The expedition of Sturt from South Australia to the center of the country in 1845, dispelled the notion of a great inland sea, but it substituted the much less hopeful one of a vast and burning lifeless waste; and this opinion appeared to be corroborated by the fate of the gallant Leichhardt, who, after his successful overland journey from New South Wales to Port Essington in North Australia, started in 1847 to traverse the island from Queensland to Western Australia, and was never more heard of. It was for a time universally considered as decided that a million of sq.m. in the interior was hopelessly barren, and in consequence further explorations were abandoned. However, in 1858, John M'Douall Stuart, a companion of Sturt in his travels, having made a short expedition to the n.w. of the colony of South Australia, brought back the cheering news that a very extensive tract suitable for colonization existed in that quarter, well supplied with lakes and running "creeks," and presenting millions of acres of excellent pasture. Despite, therefore, the arrival of Gregory in the same year from the n.e. of the colony with additional unfavorable reports, Stuart resolved to resume once more the exploration of the interior from s. to n.; and, starting from South Australia in 1860, he held a generally n. by w. course, till his further progress was stopped by the threatening aspect of the natives, at a point in lat. 18° 17′ s., long. 134° e. Returning with his two companions to organize a stronger force, he retraced his steps (1861) on the previous track; but, after traveling 100 miles further than before, was baffled by an impenetrable scrub, through which he in vain sought a passage. Want of provisions forced him to return a second time; but nothing daunted he started once more in 1862 along the now familiar path, and on July 24th of that year stood on the shore of the Indian ocean at Van Diemen's gulf. Mr. Waterhouse, the naturalist, who accompanied Stuart in his third expedition, divides the country passed through into three regions: the first, extending as far n. as lat. 27° 18′ s., is watered by springs and is suitable for pastoral purposes, though subject to great heat and drought in summer. The springs either issue from the surface of the plains or from the tops of curious conical eminences evidently of volcanic origin; these eminences varying from the size of a beehive to a considerable hill. The second region, extending northwards to lat. 17° 36′ s., is much more defective in water-supply, and its vegetation chiefly consists of a pungent-flavored coarse grass, known as "porcupine grass" (otherwise *spinifex* or *triodia pungens*), good pasture being only found in the hollows of creeks. This region also presents several ranges of hills of low elevation, the maximum height being 2000 feet above the plain. The third region, which extends from lat. 17° 36′ s. to the sea-coast, possesses a rich soil, sometimes lacustrine and sometimes alluvial, clothed with the usual abundance of tropical vegetation, and well timbered.

The resumption of the exploration of interior Australia by Stuart had the effect of arousing general attention to the subject in the other colonies; and accordingly, while Stuart was on his 1860 expedition, the colony of Victoria was fitting out another party for the same purpose. This expedition, which was put under the command of R. O'Hara

Burke, consisted of a large party with a number of camels (which had a short time previously been imported by the Victorian government from India), and left Melbourne on Aug. 20, 1860, reaching Cooper's creek in the middle of December. Finding that his company was too numerous and too much encumbered, Burke left the greater portion at the creek under Brahe, to await his return, and with his second in command, William John Wills, and two others, Gray and King, started, with 6 camels, 1 horse, and 12 weeks' provisions, in a northerly direction, reaching the mouth of the Flinders river, at the head of the gulf of Carpentaria, on Feb. 11, 1861, being the first explorers who crossed Australia from sea to sea. Unable, however, to obtain a view of the ocean, on account of the extensive marshes which skirt the coast-line, they commenced their return journey, and, arriving at Cooper's creek on April 21 found, to their astonishment, the camp completely deserted. From indications marked on a tree close by, they were induced to dig at its foot, and found a small supply of provisions, and a note to the effect that the party in waiting had left Cooper's creek to return home; the note being dated April 21, the very day on which the exhausted explorers reached the camp, and having been only seven hours written when read by Burke. In their worn-out condition, it was a hopeless task to think of following this fresh party to the river Darling through 400 m. of desert, though, had they done so, they would have met Brahe returning with a third section of the expedition, which he had met at the Darling, and led back to Cooper's creek, reaching it on May 8, but retracing the road to the Darling, on finding (after a very slight examination) no signs of Burke's party having arrived there; so Burke, resolving to gain the nearest pastoral station of South Australia, 150 m. distant, the three travelers (Gray had already succumbed to fatigue and famine) pursued this new route at the rate of 4 to 5 m. per day, till want of water compelled them to return to the Cooper, though, had they known that the station they sought was not more than 50 (instead of, as they thought, 100) m. off, they might by a strong effort have reached it, and been saved. Instead of this, they returned to Cooper's creek; and their camels being now all dead, and their provisions nearly exhausted, they resolved, as a last resource, to seek out some camp of natives, where they might remain till assistance reached them from the colony. But their limbs were growing feebler and feebler; at last, on June 28, Wills lay down to die, requesting the others to go on; and on June 30, Burke also succumbed. King, the sole survivor, succeeded in reaching the natives, with whom he lived for 2½ months, till a party under Howitt, which was sent out from Victoria in quest of Burke and Wills, arrived at the creek, and rescued him. Burke's experiences of the interior are, as far as we can gather from the scanty records, equally favorable with those of Stuart. He found some good grassy country n. of the Cooper, then passed through a sandy and stony district; but from the tropic of Capricorn to the sea, a large proportion was richly clad with verdure and well watered, with now and then a range of hills traversing it.

The unaccounted-for absence of Burke and Wills produced much excitement in the two southern colonies, and gave birth to three separate expeditions, with the view of bringing aid to the missing explorers. Two of these were fitted out by Victoria, and one by South Australia. The former two were intended to act in concert, and were sent round from Melbourne to Rockhampton, in Queensland, in the *Firefly* of 200 tons. At Rockhampton, Walker and his party were landed, in order to make the gulf of Carpentaria overland, while the brig pursued her voyage to the head of the gulf, and landed Landsborough and his party at the mouth of the river Albert, in the middle of Oct., 1861. On the 17th, Landsborough commenced his march, and following out his instructions to make for Stuart's "central" mount, followed up the Albert and Gregory rivers, and thence diverging more to the w., found that the water-supply had wholly failed. Turning then southwards along the river Herbert, his small party of three whites and two aborigines in all were compelled to stop in lat. 20° 11½′ s. by the menacing attitude of the natives, and returned to their dépôt on the Albert, which they reached on Jan. 19, 1862. Here they learned that Walker had arrived on Dec. 7; bringing the important news that he had found traces of Burke's party on the Flinders; and Landsborough accordingly resolved to penetrate in an easterly direction. On reaching the Flinders, he found all traces obliterated by the rains, but notwithstanding ascended the river for 280 m., then crossed to the Thompson, followed it up for the greater part of its course, afterwards striking out eastwards to the Barcoo or Cooper, and failing to reach Cooper's creek on account of the extreme drought, made for the settlements on the Darling, and arrived at Melbourne in Aug., 1862. Landsborough found the country between the gulf and the Thompson to consist of good soil thickly grassed; and, with rare exceptions, water was generally abundant.

The South Australian expedition was got up on a much larger scale, consisting of 8 men, 4 camels, 26 horses, 12 bullocks, and 100 sheep, and was put under the command of M'Kinlay, an experienced explorer. It started from Adelaide on Aug. 16, 1861, and on Sept. 24, had passed the furthest settlements of the colony; crossed the formerly mysterious lake Torrens, which was at that time a dry desert; and came into a district abounding with lakes and creeks, and luxuriantly clad with grass whenever the rain afforded support to animal life. Here it was learned that the fate of Burke and Wills had been ascertained, and the party then held northwards for the gulf of Carpentaria. Leaving the lake district, they entered the great desert, whose inhospitable nature had been so vividly described by Sturt 16 years before; but curiously enough, in a district

in which Sturt had almost perished of thirst, M'Kinlay's party were almost carried away by a flood. In lat. 25° s., they emerged on an extensive country, abounding in grassy plains, watered by rivers, and intersected by hill ranges; and in lat. 22° s. they entered upon a country of tropical character, reaching the Leichhardt, which they followed down till the deep and broad mangrove creeks and boggy flats which form a wide border round the beach of the gulf, hindered their further progress; so that, like all the preceding explorers, with the exception of Stuart, a glimpse of the ocean was denied them. From the Leichhardt river they then proceeded in an e. by s. course, reaching Bowen at Port Denison, in Queensland, in the beginning of Aug., 1862, and thence reached Adelaide by sea.

The results of these explorations of interior Australia agree in this, that there is a much larger extent of territory available for colonization than was formerly believed; that, in fact, by far the greater portion of the interior is more or less suitable for colonization, and that only to that portion of it lying in the center in lat. 27° to 25° s. can the term desert be with justice permanently applied. Yet Sturt's desert was certainly no fancy, and his route to the center of the interior was through a barren waterless waste, while M'Kinlay, who followed nearly the same track, was delighted with abundance of rich pasture and water. The truth seems to lie between the two extremes; Sturt's expedition was carried out during a year of unusual drought, while the recent expeditions here sketched took place during exceedingly moist seasons, the year 1861 and 1862 being the wettest the colonists of Victoria had ever known. Consequently, we should err in supposing the interior to be a mere desert on the one hand, or a blooming, well-watered expanse on the other. It is in reality a surface covered with soil more or less fertile; the basaltic rocks and clays being the most, and quartz, sandstone, and granite least fertile; and the rainfall is sufficient, in ordinary seasons, to revive the dormant germs of vegetable life, and cover the surface with a crop of grass more or less luxuriant. On the other hand, the occasionally long continuance of drought, accompanied with an excessive amount of evaporation, wholly dries up some streams, converts others into a series of pools, connected by threads of water, or "creeks," reduces extensive lakes to marshes or to shallow pools, in which the concentration of the soluble salts of the soil renders the water so brackish as to be wholly undrinkable, and restores the verdant surface for a time to the condition of a desert, herbage remaining only on the banks of creeks. The rainfall, which is the sole water-supply in the central districts, does not occur at regular intervals, but there is every reason to suppose that the excessive drought experienced by Sturt has not reappeared since 1845. Occasionally, the fall of rain is so excessive as to convert the whole of the plain, as far as the eye can reach, into a shallow sea, which, however, soon disappears by the drainage of the rivers and creeks, or under the influence of the excessive evaporation, and in an almost incredibly short period thereafter, the ground is clothed with verdure. The climate of the northern districts is very different; there we have a temperature even higher, but its effect on vegetation is rendered very favorable by the frequent and moderate rains.

These expeditions have also contributed a few facts respecting the rivers of North Australia. The Flinders was estimated by Landsborough to be fully 500 m., and the Albert 100 m. long; the Roper was found by Stuart to be a deep wide river at about 100 m. from its mouth; on the whole, the river system of North Australia is much more extensive than was formerly supposed.

In 1865, an expedition under the command of M'Intyre, was undertaken to ascertain the fate of Leichhardt, but it could not advance further than Cooper's creek.

Our knowledge of the interior of western Australia was considerably extended by the expedition which started from the west under Forrest in 1869; and the observations made during the construction of the overland telegraph line from Adelaide to Port Darwin, on the gulf of Carpentaria, confirmed the view that some of the interior of the island continent is fitted for agricultural purposes. The expeditions of Gosse and Warburton in 1873 explored part of the *terra incognita* w. of the central telegraph line. Forrest in 1874 again crossed the country from Perth eastward, reaching the telegraph lines in 27° s. lat.; waterless and treeless wastes were the distinguishing features. Giles in 1876 traversed the continent in a n.e. direction, finding the country to the eastward desolated with drought. H. V. Barclay in 1878 crossed the hitherto unknown country between Alice Springs on the telegraph lines and the e. boundary of South Australia, in e. long. 136° 30′. All the water-courses and creeks passed over were dried up, but some fine country was laid open. The view northwards in s. lat. 21° 50′, only disclosed sand ridges and spinifex.

AUSTRASIA, or the East Kingdom, the name given, under the Merovingians, to the eastern possessions of the Franks, embracing Lorraine, Belgium, and the right bank of the Rhine, and having their central point at Metz. At the time of the rise of the Frankish power, these districts were of great importance, as they formed the connection with the German mother-country, and were the most thickly inhabited by Franks. After the time of Charles Martel, the division of the Frankish kingdom into A. and Neustria lost its political importance. Under Charlemagne's successors, A. merged into Germany—and Neustria, or west Frank-land, into France.

AUSTRIA, ARCHDUCHY OF, the cradle and nucleus of the Austrian empire, lies on both sides of the Danube, from the mouth of the Inn to Presburg, on the borders of Hungary, and embraces an area of about 15,000 sq.m., with a pop. in 1854 of 2,624,237. It now forms three of the crown-lands, or administrative provinces of the empire—viz., lower and upper Austria (or Austria below, and Austria above the Ens), and the duchy of Salzburg. See AUSTRIA, EMPIRE OF. The s. and w. portions are mountainous; the n. and e. are more level and fertile, containing the great plain of Vienna, the Marchfeld, etc. The pop. is mostly German and Catholic. The chief towns, besides Vienna, are Wiener-Neustadt, Salzburg, Steyer, Linz, and Ischl (q.v.).

AUSTRIA, EMPIRE OF, or AUSTRO-HUNGARIAN MONARCHY. The Austrian dominions form a compact territory, with a circumference of about 5350 miles. The body of the empire lies in the interior of Europe, though it has about 500 m. of sea-coast on the Adriatic. A. borders on Italy, Switzerland, Bavaria, Saxony, Prussia, Russia, Roumania, Servia, Turkey, and Montenegro. With the sanction of the Berlin congress of 1878, the small territory of Spizza, on the Montenegrin frontier and formerly Turkish, has been incorporated with Dalmatia; the Turkish provinces of Bosnia and Herzegovina, though occupied and also administered by Austria, cannot of course be regarded as part of the Austro-Hungarian monarchy. The following table shows the area and population of the empire at the time of the census:

Crown-lands.	Area in Sq. Miles.	Population in 1869.
Lower Austria	7,563	1,990,708
Upper Austria	4,576	736,557
Salzburg	2,734	153,159
Styria	8,567	1,137,990
Carinthia	3,958	337,694
Carniola	3,811	466,334
Coast districts, or Illyria	3,048	600,525
Tyrol and Vorarlberg	10,980	885,789
Bohemia	19,822	5,140,544
Moravia	8,481	2,017,274
Silesia	1,964	513,352
Galicia	29,874	5,444,689
Bukowina	3,981	513,404
Dalmatia	4,881	456,961
Hungary	68,583	11,633,162
Croatia and Slavonia	18,432	1,168,037
Transylvania	23,147	2,115,024
Military frontiers	12,800	593,232
Total	237,202	35,904,435

A later estimate of the total area makes it just 240,000 sq. miles. In 1876, the pop. was calculated to have increased to 37,350,000.

This population comprises the military establishment, which, excluding the landwehr, was, at the end of 1876, on a peace footing, 271,757 men; and 777,496 on a war footing. The naval forces of Austria consisted, in April, 1876, of 47 steamers and 10 sailing-vessels.

The first eleven of these divisions—except a part of Illyria—and also part of Galicia, making an extent of 75,180 sq.m., with a pop. of above 12,000,000, formerly belonged to the German Confederation.

Surface.—Three fourths of A. is mountainous or hilly, being traversed by three great mountain chains—the Alps, Carpathians, and Sudetes (q.v.), whose chief ridges are of primitive rock. The Rhætian and Noric Alps stretch from Switzerland to the Danube, and contain the highest points of the Austrian territories, the Ortler Spitze rising to 12,779 English feet. Their height declines gradually towards the e., where the Leitha hills (3000 ft.), overlooking the plain of Vienna, form the transition to the Carpathians. This chain rises on the left bank of the Danube, near Presburg, and sweeping in a curve, first e., and then southward through Transylvania, again meets the Danube. The highest point is Butschetje, in Transylvania, where a height of 9528 ft. is reached. The central part, or Tatra mountains, are vast granitic masses, resembling the Alps in character; the highest of these is the Lomnitz, in the longitude of Cracow, 8133 feet. The Alps are accompanied, n and s., by parallel ranges of calcareous mountains, covering whole provinces with their ramifications. The Carpathians are lapped on their northern side by sandstone formations; mountains of the same character also occupy Transylvania. Springing from the n.w. bend of the Carpathians, the Sudetes run through the n.e. of Moravia and Bohemia, in which last the range is known as the Riesengebirge, or Giant mountains. The boundary between Bohemia and Prussian Silesia passes over the Schneekoppe, the highest peak of these mountains, which is 5275 ft. in height. Continuous with this range, and beginning on the left bank of the Elbe, are the Erzgebirge, or Ore mountains,

on the confines of Saxony; and veering round to nearly s.e., the range is further prolonged in the Bohemian-forest mountains, between Bohemia and Bavaria.—The chief plains of the Austrian empire are the great plains of Hungary (the smaller of these is in the w., between the offsets of the Alps and Carpathians, and is about 4200 sq.m. in extent; the other, which is in the e., and traversed by the Danube and the Theiss, has an area of 21,000 sq.m.), and the plain of Galicia.

From the gulf of Triest to the s. point of Dalmatia, A. has a sea-line of about 1000 m., not counting the coasts of the numerous islands, the largest of which is Veglia, 23 m. by 12. The chief lakes are the Platten see (about 400 sq.m.), and the Neusiedler see (about 100 m.), both in Hungary. The first is navigable by steamers, and both are rich in fish, and have fruitful vineyards around them. The Alps and Carpathians inclose numerous mountain lakes. The Long lake in the Tatra mountains lies at an elevation of 6000 feet. The most remarkable of all is the Zirknitz lake (q.v.) in Illyria. There are extensive swamps or morasses in Hungary. One connected with the Neusiedler see covers some 80 sq. miles. A good deal has been done in draining morasses.

The leading rivers that have navigable tributaries are: the Danube (q.v.), which has a course of 849 m. within the Austrian dominions, from Passau, at the mouth of the Inn, to Orsova, on the frontier of Walachia, and receives, on the right, the Inn, Traun, Ens, Leitha, Raab, Drau, and Save; and, on the left, the March, Waag, Neutra, Gran, Theiss, Bega, and Temes: the Vistula (q.v.), with its tributary the Bug: the Elbe (q.v.), with the Moldau and Eger: the Dniester and Adige (q.v.) have no navigable tributaries; this last, which rises in the Rhætian Alps, and flows past the famous city of Trent, enters Lombardy above Verona, and confers on that country the benefits of what commercial importance it possesses—being navigable only up to a point below Legnago. The Rhine only bounds the empire for about 14 m. above lake Constance. The Isonzo, Zermagna, Kerka, and Narenta flow into the Adriatic.

The canal system of Austria is in general not extensive. Canal construction is recent. The Vienna and Neustadt canal, in lower Austria, has a length of 40 m.; the Bacser or Franz canal, between the Danube and Theiss in Hungary, 69 m.; and the Bega canal, constructed by the Romans, between the Bega and Temes, 83 miles. Extensive lines are still capable of being opened up, affording the only possible communication with many places now inaccessible, and, at the same time, the means of rescuing tracts of arable land from inundations.

The *climate* of A. is on the whole very favorable; but from the extent and diversity of surface, it presents great varieties. In the warmest southern region between 42° to 46° lat., rice, olives, oranges, and lemons ripen in the better localities; and wine and maize are produced everywhere. In the middle, temperate region from 46° to 49°, which has the greatest extent and diversity of surface, wine and maize still thrive in perfection. In the northern region, beyond 49°, except in favored spots, neither wine nor maize succeeds; but grain, fruit, flax, and hemp thrive excellently. The mean temperature of the year is, at Triest, 58° F.; at Vienna, 51°; at Lemberg, in Galicia, 44°.

The raw products of A. are abundant and various; and in this respect it is one of the most favored countries in Europe. What one province lacks, another supplies. Its mineral wealth is not surpassed in any European country; it is only lately that Russia has exceeded it in the production of gold and silver. Mining has been a favorite pursuit in A. for centuries, and has been encouraged and promoted by the government. Bohemia, Hungary, Styria, Carinthia, Salzburg, and Tyrol take the first place in respect of mineral produce. Except platina, none of the useful metals is wanting. The mines are partly state property, and partly owned by private individuals. The value of their yearly produce is estimated at about £9,000,000. Of this sum coal yields about a half, iron a fifth, salt a tenth, and gold and silver together one fourteenth. The number of persons employed in mines and smelting-works is about 150,000, a third of whom are in Hungary. Gold is found chiefly in Hungary and Transylvania, and in smaller quantity in Salzburg and Tyrol. The same countries, along with Bohemia, yield silver. The discovery of quicksilver at Idria (q.v.) first brought this branch of mining industry into importance. This metal is now also found in Hungary, Transylvania, Styria, and Carinthia. Copper is found in many districts—tin, in Bohemia alone. Zinc is got chiefly in Cracow and Carinthia. The most productive lead-mines are in Carinthia. Iron is found in almost every province of the monarchy, though Styria, Carinthia, and Carniola are chief seats. The production, though great, is not yet equal to the consumption. Antimony is confined to Hungary; arsenic is found in Salzburg and Bohemia; cobalt in Hungary, Styria, and Bohemia; sulphur in Galicia, Bohemia, Hungary, Salzburg, etc., though not enough to supply home consumption. Graphite is found abundantly in Bohemia, Moravia, Carinthia, etc.

The useful earths and building stones are to be had in great profusion; all sorts of clay up to the finest porcelain earth (in Moravia, Bohemia, and Hungary), and likewise marble, gypsum, chalk, etc. Of precious and semi-precious stones are the Hungarian opal (which passes in commerce as oriental), Bohemian garnets (the finest in Europe), cornelians, agates, beryl, amethyst, jasper, ruby, sapphire, topaz, etc.

The following table shows the principal metals and minerals produced in A. in 1872, and their value in florins:

	Weight.	Value in florins.
Gold (Austrian pound)	2,804	1,892,287
Silver "	74,043	3,331,925
Quicksilver (Austrian hundredweight)	7,170	1,240,798
Zinc " "	45,013	477,179
Copper " "	30,886	1,342,033
Lead " "	102,339	1,305,646
Iron, raw and cast " "	8,477,115	.....
Graphite " "	648,318	.....
Mineral coal " "	93,971,990	.....

A. is peculiarly rich in salt. Rock-salt exists in immense beds on both sides of the Carpathians, chiefly at Wieliczka (q.v.) and Bochnia in Galicia, and in the co. of Marmaros in Hungary, and in Transylvania. The annual produce of rock-salt is greatly above 3,000,000 cwt. Salt is also made at state salt-works by evaporating the water of salt-springs. The chief works are those at Ebensee, Aussee, Hallstadt, Ischl, Hallein, and Hall in Tyrol. From two to three million cwt. are thus produced annually. A considerable quantity is also made from sea-water on the coasts of the Adriatic. The sale of salt is in A. a government monopoly. Of other salts, alum, sulphate of iron, and sulphate of copper are the chief. There are inexhaustible deposits of coal in the monarchy; but they have not yet been rightly explored, nor are nearly all that are known yet worked. They are spread over all the provinces; but the richest are in the mountain-systems of Moravia and Bohemia. Of recent years, however, a great deal has been done to develop this particular branch of mining. A. has abundance of mineral springs, frequented for their salubrity; 1600 are enumerated, some of them of European reputation, as the sulphurous baths of Baden in lower A., the saline waters of Karlsbad, Marienbad, and Ofen, etc.

The *vegetable productions*, as might be expected from the vast variety in the soil and position of the different provinces, are extremely various. Although three-fourths of the surface is mountainous, more than five-sixths is productive, being used either for tillage, meadows, pasture, or forest. Grain of all kinds is cultivated, most abundantly in Hungary and the districts s. of it on the Danube; in Bohemia, Moravia, Silesia, and Galicia. Agriculture is not yet far advanced; the prevailing system is still what is called the three-field system, introduced into Germany by Charlemagne, in which a crop of winter wheat is followed by one of summer grain, and that by fallow. In Hungary, the Magyar adheres to his primitive husbandry, the German and Slav are adopting rational methods. Rice is cultivated in the Banat, but not enough for the consumption. Potatoes are raised everywhere; and in elevated districts are often the sole subsistence of the inhabitants. Horticulture is carried to great perfection; and the orchards of Bohemia, A. proper, Tyrol, and many parts of Hungary, produce a profusion of fruit. Great quantities of cider are made in upper A. and Carinthia, and of plum brandy in Slavonia. In Dalmatia, oranges and lemons are produced, but not sufficient for the requirements of the country; twice as much olive-oil is imported as is raised in the monarchy.

In the production of wine, A. is second only to France. With the exception of Galicia, Silesia, and upper A., the vine is cultivated in all the provinces; but Hungary stands first, yielding not only the finest quality of wine, but four-fifths the amount of the whole produce of the empire. The average produce of the whole empire is estimated at about 400,000,000 gallons, which is mostly consumed by the inhabitants themselves.

Of plants used in manufactures and commerce, the first place is held by flax and hemp. Flax is cultivated almost universally; white hemp in Galicia, Moravia, and Hungary. Tobacco is raised in great quantities, especially in Hungary, which also is first in the cultivation of rape-seed. Bohemia raises hops of the first quality, which are partly exported; though other provinces require to import from abroad. The indigo plant has been lately successfully acclimatized in Dalmatia. Nearly a third of the productive surface is covered with wood (66,000 sq.m.), which, besides timber, yields a number of secondary products, as tar, potash, charcoal, bark, cork, etc.

As to *animals*, bears are found in the Carpathians, Alps, and Dalmatia; wolves, jackals, and lynxes in these same districts, and also in the Banat, Croatia, Slavonia, and the military frontiers. The marmot, otter, and beaver are also found in Dalmatia. Game has of late sensibly diminished. The wild goat lives in the highest, the chamois and white Alpine hare in the middle regions of the Alps and Carpathians. More productive than the chase are the fisheries of the Danube, Theiss, and numerous streams, lakes, and ponds. The chief sea-fishing is in Dalmatia. Leeches, procured chiefly in Hungary and Moravia, form an article of considerable trade. For foreign commerce the most important branch of rural industry is the rearing of silk. A. produces about a quarter of a million of silk cocoons annually. The silk trade is very extensive in the Tyrol—the yearly supply of cocoons in that country being 32,000.

The breeding of *domestic animals* has not yet advanced to what the home wants require. In some districts it is excellent, in others quite neglected. Horse-breeding is promoted by what are called "military studs." Besides a number of imperial studs,

there are a great many private establishments, especially in Hungary, for the same purpose. The supply of black-cattle is not equal to the demand; great numbers are furnished by Hungary and Galicia. The breeding of sheep, like that of horses, has been a special object of care to the government. The finer wools are furnished by Moravia, Bohemia, Silesia, lower A., and great part of Hungary and Galicia. The great mass is, however, composed of what is known as middling and inferior sorts. Goats are reared chiefly in Dalmatia, and swine in Hungary. In 1873, the number of horses in the monarchy was stated at 3,548,442; cattle, 12,704,405; sheep, 20,103,395; goats, 1,552,055; swine, 6,994,752; and bee-hives, 1,531,152. Nearly three-fourths of the population are engaged in husbandry, so that A. is decidedly an agricultural state, though its capabilities in this respect have by no means been fully developed.

The *population* is very unequally distributed. The most populous districts are those of the s.w. and of the n-w. The Alpine regions and those of the Carpathians are the sparsest; and generally the density diminishes towards the east. At the end of 1869 Austria had, besides Vienna, 3 cities of above 100,000 inhabitants, and 32 others with more than 20,000. Vienna, with 834,284 inhabitants then, was found by special census in 1875 to have, with suburbs, 1,020,770. The population of Austria embraces a greater number of races, distinct in origin and language, than that of any other European country except Russia. The proportions in this respect are here given from the official statements of 1870. The Slavs are the most numerous race, amounting to 16,219,000, nearly 50 per cent of the whole population in 1870. They form the bulk of the population of Bohemia, Moravia, Carniola, Dalmatia, Croatia, Slavonia, the military frontiers, the Woiwodina, the n. of Hungary, and Galicia. They are, however, split up into a number of peoples or tribes, differing greatly in language, religion, culture, and manners; so that their seeming preponderance in the empire is thus lost. The chief branches of the Slavic stem are the northern Czechs (the most numerous of all), Ruthenes, and Poles, and the southern Slowens, Croats, Serbs, and Bulgarians. The Germans numbered 9,040.000, or about 25 per cent. They are dispersed over the empire, but predominate most in the duchy of A., Salzburg, Tyrol, Styria, Carinthia, w. of Hungary, etc. The Romanic peoples (speaking languages derived from that of ancient Rome) amounted to 3,456,000, or fully 9½ per cent, and are divided into western and eastern. To the first, the Germans give the general name of Welsch. They consist of Italians, inhabiting the s. of Tyrol, Istria, and Dalmatia; the Ladins (Latins), occupying some valleys in Tyrol; and the Friauls about Görtz, n. of Triest. The eastern Romans are the Valaks or Wallachians, styled by themselves Rumuni, who are found in Transylvania, Hungary, the Woiwodina, Bukowina, and military frontiers. The Magyars, or Hungarians proper, numbered 5,431,000 (over 15 per cent): they are located chiefly in Hungary and Transylvania; also in the Woiwodina, and a few in Croatia and Slavonia. The small remaining portion are composed chiefly of Jews, Armenians, and Bohemians or gypsies; and collectively they number 1,354,000, which is pretty nearly 3¾ per cent.

As to *religion*, the great bulk of the nation is Roman Catholic. At the beginning of 1870 there were 23,954,233 Roman Catholics; of Greeks in union with the church of Rome there were 3,941,796; not in union, 3,050,830. The Protestants of all denominations numbered 3,570,989; and the Jewish persuasion claimed 1,375,861. The church of Rome has 11 archbishoprics and 40 bishoprics, and an army of secular priests. At the accession of Joseph II., there were 2024 convents; but at the end of the French war (1816) they had been reduced to 800. There are at present nearly 300 abbeys and above 500 convents in the empire.

Education, since 1849, is under the care of a minister of public worship and instruction. As compared with other German states, the education of A. presents some peculiarities. There is a greater prevalence of establishments where the pupils both live and receive instruction; also of schools for special callings. Instruction, again, whether high or low, is mostly gratuitous, or of trifling cost, being provided from general or local public funds. The government has recently made liberal allowance for elementary education. Another peculiarity is the sway of the clergy, both in schools and universities. The primary schools are, to a very large extent, in their hands. The number of elementary schools has increased greatly in recent times. The law enforces compulsory attendance at the "Volks-schulen," or national schools, of all children between the ages of 6 and 12; and parents are liable to be punished for neglecting to send them. Hungary is still backward in elementary education. There are eight technical schools in the empire. The eight universities are at Vienna, Prague, Grätz, Innsbrück, Pesth, Cracow, Lemberg, and Czernowitz (the latter founded in 1875). The first four of these, ranking as German universities, had in 1872—

Professors and teachers—	Vienna.	Prague.	Grätz.	Innsbrück.
Ordinary professors	68	48	40	41
Extraordinary professors	38	22	10	7
Assistant professors	86	21	17	9
Teachers of languages, etc.	8	6	3	1
Total	200	97	70	58

	Vienna.	Prague.	Grätz,	Innsbrück.
Students—				
Faculty of theology.....	198	207	103	197
" jurisprudence.....	1304	640	312	104
" philosophy.....	697	265	143	148
" medicine.....	1383	500	292	79
Total matriculated students.....	3564	1612	850	528
Non-matriculated students.....	317	97	76	84
Total.....	3881	1709	926	612

In 1875, Vienna had 3920 students; Prague, 1751; Pesth, 122 teachers and 1912 students; Cracow and Lemberg, the universities of Galicia, and the other Slavonian provinces, number 70 professors and 1800 students. There are also a large number of establishments where the pupils are received young, and educated and trained for special professions, for the army and navy, for the counting-house, for the mine and the farm, as accoucheurs, etc. There are, besides, a large number of institutes for the promotion of science and art. The fruits of this extensive educational system are not what might be expected, in consequence of the priestly and monarchical restrictions which hedge it round. The chief libraries are the imperial and university libraries of Vienna. There are in the whole monarchy 755 newspapers and other periodical prints, of which fully the half are in German. Such of them as are political are fettered by conditions which render them quite worthless as organs of public opinion.

The *manufacturing industry* of A. is not yet adequately developed, but of late years has made great strides. The annual value of its manufactures—not including small trades—is estimated at 1200 to 1500 million florins, while that of its husbandry may reach 2500 millions. Bohemia takes the lead in this industry; then follow Austria proper, Moravia and Silesia, and Hungary. Vienna is the chief seat of manufacture for articles of luxury; Moravia, Silesia, and Bohemia for linen, woolen, and glass wares; Styria and Carinthia, for iron and steel wares. The chief manufactured articles of export are those of silk and wool; the only others of consequence are linen twist, glass wares, and cotton goods. The yearly value of manufactured iron is about 54 million florins. The glass wares of Bohemia are of special excellence. The hemp and flax industry is one of the oldest and still most important. No branch of industry has risen more rapidly than that of cotton. The manufacture of silk is very extensive. The manufacture of tobacco is a state monopoly, and brings a revenue of nearly 60 million florins; the salt monopoly, 18 millions.

In respect of *commerce*, A. is most unfavorably situated. High mountains oppose great obstacles on all hands to communication, and separate the producing districts from the only sea that touches the empire; while the chief navigable rivers have their mouths in other countries. Much has been done to remedy these obstacles. Since 1809, a length of 20,000 m. of highways has been made. The great Alpine roads over the Stelvio pass and the Semmering (q.v.) are among the most remarkable constructions of our times. More remarkable still are the railways over the Brenner pass and the Semmering. The first railway in A. was a horse railway, constructed in 1825–32. The state in 1841, resolved to undertake the construction of railways, and since then a great extent has been laid down. A tolerably complete network of railway now brings all places of importance into easy communication with each other. The total length of railways in the empire open to traffic in Oct., 1876, was 10,852 English miles. The length of lines under construction was about 2000.

The length of telegraph lines in the empire in 1876 was about 28,000 English miles. The number of messages carried in 1875 was 5,458,920. In 1876 there were in Austria proper 4366 post-offices, and in Hungary 1930. The number of letters and packets passing through the post in A. in 1875 was 244,331, and in Hungary in 1874, 68,673.

River-communication received a great impulse from the introduction of steam. By means of the Danube steam company, formed in 1850, and a second company (1852) confined to tug-navigation, passengers and goods are now conveyed on the Danube between Ulm and Galatz, and on to Constantinople. The Austrian Danube steam company has a fleet of steamers plying on the Danube, the annual receipts from conveyance of goods being more than 7 million florins. This traffic would be vastly greater were the lower Danube freed from the influence of Russia.

A great number of the political impediments to commerce have been removed or diminished. The customs-boundary that separated Hungary and the adjoining provinces from the rest of the empire, was done away in 1851, so that the whole is included in one customs district, with the exception of Dalmatia, which still forms a small district by itself; the free ports of Triest, Fiume, one or two other minor free ports and districts. By the new tariff, which came into partial operation in 1852, A. has passed from a prohibitive to a protective system. No article is admitted duty-free; but absolute prohibition is confined to articles of state monopoly (salt, powder, and tobacco). Goods for mere transit or trans-shipment pay no duty. But the foreign commerce of A. is nothing compared with that between the different provinces. The great center of this internal commerce is Vienna: other important markets are Linz, Prague, Lemberg, Brody, Pesth,

Grätz. The imports and exports of merchandise and bullion for the whole of the empire except the province of Dalmatia, which, as has been mentioned, is not within the imperial line of customs, were tabulated as follows for 1875 and 1876:

	Merchandise. Florins.	Bullion and Coin. Florins.
IMPORTS—1875	552,500,000	15,800,000
1876	516,900,000	33,800,000
EXPORTS—1875	504,500,000	18,400,000
1876	509,600,000	30,500,000

For Dalmatia, the imports were in 1875, 13,400,000 florins, and in 1876, 12,900,000; the exports in 1875 were 10,400,000, and in 1876, 7,800,000. The principal articles of import into the Austrian empire are raw cotton and other materials for spinning, the value of this item reaching in 1876 the sum of 95,600,000 florins. Next in importance come manufactured cloths, valued at 61,600,000 in 1876; tobacco, and miscellaneous colonial produce. Some of the imports are partially re-exported; of native produce exported the most important are articles in metal, valued at 67,200,000 florins; cereals, 54,600,000; wood, 30,600,000; and pottery, 29,200,000.

The chief harbors of A. are those of Istria—Triest, Rovigno, Pirano, Citta Nuova, etc.; of Croatia—Fiume, Buccari, Novi; of Dalmatia—Zara, Spalatro, Ragusa, Cattaro, Curzola, etc.

As to *form of government*, A. is a monarchy hereditary in the house of Hapsburg-Lothringen. In the case of the reigning family dying out, the states of Bohemia and of Hungary have the right of choosing a new king; but for the other crown-lands, the last sovereign appoints his own successor. The reigning house must profess the Roman Catholic faith.

Till 1848, Hungary and Transylvania had a constitution limiting the monarchy, which was absolute for the rest of the empire; though the several provinces had each its consultative council composed of clergy, nobles, and burghers. After the revolution of 1848, and the subsequent reaction, all marks of independence of the separate provinces disappeared. The imperial constitution granted (*octroyirte*) March 4, 1849, as well as the provincial constitutions that followed, were abolished, and government was organized in the most absolute form by the imperial "patent" or charter of Dec. 31, 1851. The patent guaranteed to every religious body recognized by law protection in the observance of public ordinances, in the management of its own affairs, and in the possession of buildings and funds for the purpose of worship and instruction. The relation of the Roman Catholic church to the state was put upon a new footing. It was no longer under the oversight of the secular authority, the *placetum regium* and church-patronage were abolished, ecclesiastical jurisdiction for discipline, and the independent administration of church property, were conceded, and the intercourse of bishops and of all Catholics with Rome left free. The clergy had no longer to submit to examination or tests on the part of the state; they were nominated by the state, but only with the concurrence of the bishops, and without that concurrence they could not be deprived of their office. Along with all this, they obtained an overwhelming influence over education, even in the universities; and by the concordat signed in the early part of 1856, this influence was very greatly increased. The patent further guaranteed the equality in the eye of the law of all citizens irrespective of nation, rank, or religion, and the liberation of the land from all serfdom. Subsequent patents (e.g. for Hungary, Croatia, etc., in 1853) regulated the claims between existing proprietors and their vassals, and determined the indemnities due to the former for their seignorial rights.

But since the year 1867 A. has been reconstructed as a twofold empire, consisting of a German or "Cisleithan" monarchy, and a Magyar or "Transleithan" kingdom. The former is generally known as Austria proper, and the latter as Hungary. Each of the two countries has its own laws, parliament, ministers, and government; and the formal tie between them is a body known as the delegations. These form a parliament of 120 members: the one-half is chosen by the legislature of German Austria, which is represented by it, and the other half represents Hungary. The person of the sovereign is another knot in the tie between the two members of the empire. The Magyars claim, under certain conditions, the right of freely electing their monarch. The delegations have jurisdiction over all matters affecting the common interests of the two countries, especially foreign affairs, war, and finance; the ministries of which three departments are responsible for the discharge of their official functions to the delegations, a committee of whom sits permanently. The acts of the delegations require to be confirmed by the representative assemblies of their respective countries; and in this manner it is attempted to leave the self-government of both Austria proper and Hungary free.

The administration of Austria proper is divided at present among seven ministries—public education and ecclesiastical affairs, agricultural, finance, interior, national defense, commerce, and justice. Formerly the ministry was merely the collective organ of the emperor, and was responsible to him alone. But a bill passed by the reichsrath in 1867,

and sanctioned by the emperor, renders it responsible to that parliament of the western empire.

The reichsrath consists of an upper and a lower house. The upper house is constituted by princes, nobles, archbishops, bishops, and life members nominated by the emperor. The lower house numbers 353 members, elected by the 14 provincial diets of the empire in the following proportions: Bohemia, 92; Dalmatia, 9; Galicia, 63; Higher Austria, 17; Lower Austria, 37; Salzburg, 5; Styria, 23; Carinthia, 10; Carniola, 9; Bukowina, 9; Moravia, 36; Silesia, 10; Tyrol, 17; Vorarlberg, 3; Istria and Triest, 4. The members of the reichsrath are elected in the provincial diets, and no one who is not a member of one of these is eligible to the wider sphere of legislation. The emperor nominates the presidents and vice-presidents of both houses. The rights claimed by the reichsrath are: 1. *Consent* to all military laws; 2. *Co-operation* in legislature affecting trade and commerce, customs, banking, posting, telegraphs, and railways; 3. Examination of the estimates, and general control of the public debt. To give validity to bills passed by the reichsrath, the consent of both chambers is required, as well as the sanction of the emperor.

The executive of Hungary is carried on in the name of "the king" by a responsible ministry.

Finance.—The protracted wars of the first 15 years of the 19th c. had so exhausted the resources of A., and shattered her credit, that paper money, after being already twice reduced, had again sunk to 25 per cent of its nominal value; and even 5 per cent loans could only be obtained at a sacrifice of sometimes more than 50 per cent. During the 30 years that followed the war, much was done to restore the state credit, and 4 per cent state paper was bought at par. The revolution of 1848 brought new difficulties, from which the finances had not recovered, when the Crimean war increased the expenditure; the war with Prussia and Italy in 1866 increased the public debt by about 300,000,000 florins, but on the other hand freed A. from the Lombardo-Venetian debt of about 35,000,000 florins.

The budget estimates for the common affairs of the empire, for 1872, were—revenue, 17,208,883; expenditure, 110,647,498 florins; leaving a deficit of 93,438,615. The estimated revenue for 1877 was 117,091,389 florins, which was balanced by the estimated revenue. On the 1st July, 1876, the national debt of the Austrian empire was 3,065,269,072 florins, or £306,526,906 sterling. The estimated revenue for Austria proper (the countries represented in the reichsrath) in 1877 was 376,637,817 florins; the expenditure, 405,569,474 florins.

*History.**—The nucleus around which this great empire has grown was that part of the archduchy of A. that lies below the Ens. In the age of Charlemagne, about 800, the defense of the south-eastern frontier of Germany against Asiatic hordes gave rise here to a margraviate, called the eastern mark or boundary of the empire, or Ostreich (Austria), the eastern government; which, being united in 1156 to the country above the Ens, was raised to a duchy. After coming, in 1282, into the possession of the house of Hapsburg (q.v.), it rapidly rose to a powerful state. The princes of that house extended their dominion by marriage, purchase, and otherwise, over a number of other states, and from 1438 held almost uninterruptedly the throne of the German empire. By the acquisition (1526 and 1527) of the crowns of Bohemia and Hungary, the house of A. rose to the rank of a European monarchy. In 1804, Francis declared himself hereditary emperor of A., and, two years afterwards, laid down the title of emperor of Germany and king of the Romans.

In the earliest times, what is now the duchy of A. was inhabited by the Taurisci, a Celtic people; but their name subsequently disappeared before that of the Norici. After the conquest of the Norici by the Romans (14 B.C.), the country to the n. of the Danube belonged to the kingdom of the Marcomanni (q.v.); on the s. of the river lay the Roman provinces of Noricum and Pannonia, in which last was the municipal city of Vindobona (Vienna). Tyrol formed part of Rhætia. All these boundaries were swept away by the irruption of the northern peoples; and the regions in question were occupied in succession, during the 5th and 6th centuries, by Boii, Vandals, Goths, Huns, Lombards, and Avari. After the Lombards had settled in Italy, the Ens came, about 568, to be the boundary between a tribe of German origin and the Avari, a people who had penetrated thither from the east. The Avari having, in 788, crossed the Ens, and fallen upon Bavaria, then part of the Frankish empire, Charlemagne drove them back (796) as far as the Raab, and united the district from the Ens to that river with Germany, under the name of the East Mark, Marchia Orientalis, or Austria. He sent colonists, mostly Bavarians, into the new province, and appointed over it a margrave. It came into the possession of the Hungarians in 900, but was reconquered by Otto I. in 955, and reunited with Germany.

As margrave of the reconquered province, the emperor, in 983, appointed Leopold of Babenberg (q.v.), whose dynasty ruled A. for 260 years. Under Henry Jasomirgott (1141–1177), the mark above the Ens was annexed to the lower mark, the united province raised to a duchy, and important privileges conferred on the newly named duke and

* As the history of A. and its rulers involves, for many centuries, the main strand of the thread of European history, it is given at somewhat more than the usual length.

his heirs. This Henry Jasomirgott took part in the second crusade; he also removed the ducal residence from Leopoldsberg to Vienna, now first called a city, and began the building of the cathedral of St. Stephen. Under his successors, numerous additions (Styria, Carniola) were made to the possessions of the house. Leopold VI. undertook numerous expeditions against the Hungarians and the infidels, and is reckoned the best of the Babenberg princes. The line became extinct with his successor, Frederick, who fell in battle with the Magyars (1246).

Then followed an interregnum from 1246 to 1282. The emperor Frederic II. at first treated the duchy as a lapsed fief of the empire; shortly, claims were set up by Count Hermann of Bavaria, who was married to a niece of the deceased margrave, Frederic; and when Hermann died, and the empire was distracted by the contests between rival emperors, the "states" of A. and Styria chose Ottokar, son of the Bohemian king, as duke, who made good his nomination about 1260. Ottokar, refusing to acknowledge Rudolf of Hapsburg as emperor, was defeated, and lost his life and possessions, in the battle of Marchfeld (1278); and the emperor shortly afterwards (1282) conferred the duchies of A., Styria, and Carinthia on his son Albrecht.

The accession of the Hapsburg dynasty with Albrecht I. (q.v.) was the foundation of A.'s subsequent greatness. The despotic Albrecht contended successfully with Hungarians and Bavarians, but while attempting to subdue the Swiss, he was murdered near Rheinfelden (1308) by his nephew, John of Swabia, whom he had deprived of his hereditary possessions. Of his 5 sons, Frederic was chosen (1314) by a party to the imperial throne, but was defeated (1322) by his rival, Ludwig of Bavaria. Duke Leopold was defeated at Morgarten (1315) in his attempt to reduce the Swiss cantons that had thrown off their allegiance to Albrecht I. At last, by the death of all his brothers, Albrecht II. reunited the Austrian possessions, increased by various additions. After his death (1358), two sons, Rudolf and Albrecht III., successively followed in the duchy of Austria. Another son, Leopold, held the other lands, but lost his life at Sempach, in seeking to regain the Hapsburg possessions in Switzerland. The posterity of Albert and Leopold formed the two lines of A. and Styria. During Albrecht III.'s reign, Tyrol and other districts were ceded to Austria. After his death (1395), the dukedom was held by his son, Albrecht IV. Albrecht V., who succeeded his father in 1404, by marrying the daughter of the emperor Sigismund, succeeded ((1438) to the thrones of Hungary and Bohemia, and was at the same time raised to the dignity of German emperor, as Albrecht II. With his death, in 1439, Bohemia and Hungary were for a time lost to the house of A., as were also, after a bloody struggle, the last of the family possessions in Switzerland. But the imperial dignity was henceforth uninterruptedly held by them. With Ladislaw, Albrecht's son, the Austrian line of the house closed (1457), and their possessions went to the Styrian line. Of this line was the emperor Frederic III., who raised the dignity of his house by making A. an archduchy. After the death of Ladislaw and of his own brother, Albrecht, Frederic came into the undivided possession of the archduchy (1464).

His son, Maximilian I., by marrying Maria, daughter of Charles the Bold, acquired (1477) the Netherlands. Becoming emperor on the death of his father (1493), he ceded the government of the Netherlands to his son Philip. Under Maximilian, Tyrol fell again to the chief branch of the house of A., several districts were acquired from Bavaria, and fresh claims were established on Hungary and Bohemia. The court of Vienna began to be the seat of German art and science. The marriage of the emperor's son Philip with Johanna of Spain set the house of Hapsburg on the throne of Spain and the Indies. Philip died in 1506, and on the death of Maximilian I., in 1519, Philip's son, Charles I. of Spain, was elected German emperor as Charles V. (q.v.). Charles resigned by treaty all the German possessions, except the Netherlands, to his brother, Ferdinand I. (q.v.).

Ferdinand I. had married the sister of Lewis II. of Hungary; and on the death of the latter in the battle of Mohacz (1526), he claimed the kingdoms of Hungary and Bohemia, along with Moravia, Silesia, and Lausatia. His claim was contested by John Zapolya, who secured the aid of sultan Soliman II.; and Ferdinand, after contests extending over 20 years, had finally to pay an annual tribute of 30,000 ducats to Soliman for possession of Lower Hungary. Ferdinand was also fain to surrender Würtemberg to Duke Ulrich (1534), on condition of its reverting to A. on the death of the male line. Nevertheless, the possessions of the house of A. (in the German line) were at this time already of the extent of 110,000 sq. miles. On the abdication of Charles V. (1556), Ferdinand succeeded to the imperial dignity; he died 1564, with the reputation of a good ruler, though he was strongly conservative of everything established, and introduced the Jesuits.

In the partition of the inheritance that took place among his three sons, the eldest, Maximilian II., received the imperial crown along with A., Hungary, and Bohemia; the second, Ferdinand, Tyrol and Upper A.; the third, Karl, Styria, Carinthia, etc. Maximilian was more fortunate in Hungary than his father. The death of Soliman before Szigeth (1566) led to a truce; he got his eldest son, Rudolf, crowned king of Hungary in 1572, and shortly after, of Bohemia, and also chosen king of Rome. But his attempt to bring the crown of Poland into his house failed. Maximilian II. was fond of peace, tolerant in religion, and a just ruler. He died 1576; and of his 5 sons, the eldest,

Rudolf II., became emperor. Under him, the possessions of the archduke Ferdinand of Tyrol, who had married Philippine Welser (q.v.), the beautiful daughter of an Augsburg burgher, reverted to the other two lines, Ferdinand's children not being considered noble. Rudolf II. adhered to the old feudal usages, and was a negligent sovereign, leaving everything to his ministers and the Jesuits. His war with the porte and Transylvania brought him little credit; and the Protestants of Bohemia, oppressed by the Jesuits, extorted from him a charter of religious liberty. At last he was obliged, in 1608, to cede Hungary, and, in 1611, Bohemia and A. to his brother Matthias (q.v.). Matthias, who became emperor in 1612, concluded a 20 years' peace with the Turks, and ceded (1617 and 1618) Bohemia and Hungary to his cousin Ferdinand, son of the archduke Karl of Styria, third son of Maximilian II. Matthias lived to see the outbreak of the thirty years' war (q.v.), and died March 20, 1619.

Bohemia refused to acknowledge his successor, Ferdinand II. (q.v.), to whom all the Austrian possessions had again reverted, and chose the elector palatine, Frederic V., the head of the Protestant union, as king. The states of A. and the Hungarians were also refractory. But the battle of Prague (1620) subjected Bohemia to Ferdinand; who formally set about rooting out Protestantism in that country and in Moravia, annulled their right of electing their king, and the patent of religious freedom granted them by Rudolf II., and set up a Catholic reformation tribunal which drove thousands into exile. The emperor also succeeded in extorting acknowledgment of his sovereignty from the states of A., among which Protestantism predominated; after which Protestantism was rigorously prohibited. Hungary also was at last compelled to yield, which had revolted under the prince of Transylvania. But this religious war and persecution cost the house of A. the life-blood of its possessions. Of 732 cities in Bohemia, only 130 were left; of 30,700 villages, only 6000; of 3,000,000 inhabitants, only 780,000. Under Ferdinand's successor, the emperor Ferdinand III. (1637–1657), A. continued to be a theater of war; and at the peace of Westphalia (1648), had to cede Alsace to France. Ferdinand III.'s son and successor, Leopold I., provoked the Hungarians to rebellion by his severity. Tekeli (q.v.) received aid from the porte, and Kara Mustapha besieged Vienna (1683); which was rescued only by an army of Poles and Germans under John Sobieski hastening to its assistance. The emperor's generals now reduced the whole of Hungary, which was declared a hereditary kingdom in the male line (1687). Prince Eugene compelled the porte (1699) to restore the country between the Danube and Theiss, and, in 1718, to cede other important provinces to Hungary. The struggle between Leopold and Louis XIV. of France for the heirship to the king of Spain, led to the war of the Spanish succession (q.v.), during which Leopold died, May 5, 1705. He was of sluggish phlegmatic character, and wholly under the influence of the Jesuits.

His eldest son and successor, the enlightened Joseph I. (q.v.), continued the war. He d. childless, April 17, 1711, and was succeeded by his brother, Karl VI. The peace of Utrecht concluded under his reign (1713) secured to A. the Netherlands, Milan, Mantua, Naples, and Sicily. The monarchy now embraced 190,000 sq.m., with 29,000,000 inhabitants, and had a revenue of 14,000,000 florins, with an army of 130,000 men. Its strength, however, was soon much exhausted by fresh wars with France and Spain. At the peace of Vienna (1737), Karl VI. had to give up Naples and Sicily to Don Carlos of Spain, and part of Milan to the king of Sardinia, receiving only Parma and Piacenza instead. He also lost at the peace of Belgrade (1739) nearly all the fruits of Eugene's conquests, giving back to the porte Belgrade, Servia, and the parts of Wallachia and Bosnia that had belonged to Austria. The emperor conceded all these points with the view of securing adhesion to the pragmatic sanction (q.v.), which conferred the succession on his daughter, Maria Theresa.

With his death (Oct. 20, 1740) the male line of the Hapsburgs was extinct, and Maria Theresa, who was married to Franz Stephan, duke of Lorraine, assumed the government. But counter-claims were raised on all sides, and a violent war arose, in which England alone sided with Maria. Frederic II. of Prussia conquered Silesia. The elector of Bavaria took the title of archduke of A., was crowned king of Bohemia at Linz and Prague, and elected emperor as Karl VII. (1742). The Hungarians alone stood by their heroic queen; who, at the peace of Breslau (1742) was forced to yield Silesia to Prussia. Frederic renewed the war by coming to the assistance of the emperor; but Karl dying (1745), Maria Theresa's husband was elected German emperor as Franz I. A second treaty of peace (1745) secured Silesia anew to Prussia; and at the peace of Aix-la-Chapelle (1748), A. had to cede Parma, Piacenza, and Guastalla to Don Philip of Spain, and several districts of Milan to Sardinia. These sacrifices secured the existence of the Austrian monarchy; but Maria Theresa wished to recover Silesia, and with this view, entered into alliance with France, Russia, Saxony, and Sweden; but after a bloody seven years' war (q.v.), Prussia retained Silesia, and A. had spent her blood and treasure in vain. At this time, paper-money first appeared in A., under the name of state-bonds. At Franz's death (1765), his son, Joseph II., became German emperor, and joint-regent with his mother of the hereditary states. Collateral branches of the house of A. were planted by the younger sons of Maria Theresa, the archduke Leopold of Tuscany, and the archduke Ferdinand, who married the heiress of Este (see MODENA). In the first partition of Poland (1772), A. acquired Galicia and Lodomeria, and the Bukowina was ceded by the porte in 1777. At the death of the empress in 1780, the monarchy had an

extent of 234,000 sq.m., with a pop. of 24,000,000, and a debt of 160,000,000 florins. The administration of Maria Theresa was distinguished by unwonted unity and vigor both in home and foreign relations.

Her successor, Joseph II., was an active reformer in the spirit of the enlightened despotism of the times, though often rash and violent in his mode of proceeding. He introduced economy into every department, remodeled the censorship of the press, granted liberties and rights to Protestants, abolished 900 convents, and revised the school-system. His protective system of duties, though exhibiting his narrowness as a statesman, gave a start to native manufactures. But his reforming zeal and passion for uniformity excited opposition; the Netherlands rose in insurrection, and other disturbances broke out, which hastened his end (1790). He was succeeded in the government by his brother, the grand duke of Tuscany—as German emperor, Leopold II.—who succeeded in pacifying the Netherlands and Hungary. Peace was concluded with Prussia and Turkey (1790). The fate of his sister, Marie Antoinette, and her husband, Louis XVI., led Leopold to an alliance with Prussia; but he d. (Mar. 1, 1792) before the war with France broke out. The war was declared by France on his son Franz II., the same year (see FRANCE). By the treaty of Campo Formio (q.v.), 1797, A. lost Lombardy and the Netherlands, receiving in lieu the Venetian territory; two years later, at the second partition of Poland, it was augmented by West Galicia. Franz, in alliance with Russia, renewed the war with France in 1799, which was ended by the peace of Luneville. It is needless to follow all the alterations of boundary that the Austrian dominions underwent during these wars. The most serious was at the peace of Vienna (1809), which cost A. 42,000 sq.m. of territory, and 11,000,000 florins of her revenue. It was in 1804, when Napoleon had been proclaimed emperor of France, that Franz declared himself hereditary emperor of Austria, uniting all his dominions in one empire. On the establishment of the confederation of the Rhine, he laid down the dignity of German emperor, which his family had held for nearly 500 years, and now took the title of Franz I., emperor of Austria.

The humiliating peace of Vienna was followed (1809) by the marriage of Napoleon with the archduchess Maria Louisa; and in Mar., 1812, Napoleon and Franz entered into alliance against Russia. But when the Russian campaign of 1812 had broken the power of the French emperor, his father-in-law declared war on him (Aug., 1813), and joined the alliance of England, Russia, Prussia, and Sweden. The active part which the emperor Franz now took in the downfall of Napoleon, his consenting to the banishment of his son-in-law to Elba, and the firmness with which he signed the declaration of outlawry against him on his return to France, and contributed to his final overthrow, thus deciding the fortunes of his own daughter and her son—all furnished grounds of claim to that full indemnity for her losses which A. obtained at the close of the war. In the remodeling of the map of Europe that took place at the congress of Vienna (1815), 32,000 sq.m. were added to the 253,000 possessed by A. after the last partition of Poland, besides the advantages she gained in point of compactness, and facilities for trade, especially by the acquisition of Venice and Dalmatia. Ferdinand, the emperor's uncle, was also restored to the grand duchy of Tuscany, of which he had been dispossessed by Napoleon.

After that time, A. exerted a powerful influence in European politics generally, and more especially in the German confederation; and that influence was uniformly hostile to constitutionalism (see METTERNICH). When the Polish revolution broke out, a strict neutrality was assumed; but a Polish corps that was driven into the Austrian territories was disarmed, and sent into Hungary, while a Russian division that had taken refuge on Austrian soil was let go, and equipped with the Polish weapons.

The death of Franz I. (Mar. 2, 1832) made little alteration in the policy of A.; Ferdinand I. trod in his father's footsteps. The political alliance with Russia and Prussia was drawn closer by a personal conference of the emperor with Nicolas I. and Frederic William III. at Teplitz, Oct., 1833. The wonted calm was interrupted in 1840 by the war against Ibrahim Pacha in Syria, in which A. took part in union with England. An attempt at insurrection in Italy in 1844 was a complete failure.

But under this long-continued peace and superficial calm, the internal condition of the empire was coming to a crisis. The stifling bureaucratic system of government and police supervision, had produced only irritation and discontent, and was powerless to compress the fermentation. The opposition in the several nationalities became stronger and stronger, and the tactics of playing these nationalities off against one another, no longer succeeded. The Polish insurrection, which led to the incorporation of Cracow with the monarchy (Nov., 1846), had turned into a frightful rising of the peasantry in Galicia against the nobles. This enabled the government to overpower the political rising; but the success only increased the danger of the crisis, by encouraging it to proceed in the old reckless way. In the meantime the opposition to Austrian rule in Italy, Hungary, and Bohemia, was becoming uncontrollable, and even the states of lower A. insisted on some control in the management of the state. The revolutionary movement was already in full swing in Italy, when the fall of Louis Philippe (Feb. 24, 1848) shook Europe to its foundation. A host of petitions and addresses was followed, Mar. 13, by a popular movement in Vienna, to which the government and military, after a feeble resistance succumbed. Metternich resigned, the arming of the citizens and freedom of the press were granted, and the emperor promised to convoke a consul-

tative assembly from all parts of the empire. At the same time, the opposition in Hungary had carried their demand for an independent ministry responsible to the national diet, and the emperor was not in a position to withstand it. The 22d of Mar. saw the insurrection break out at Milan, and Radetzky, the military commander, forced to retire on Verona. Venice rose at the same time, and drove out the Austrians.

While the revolution was thus victorious in the provinces, the central authority was in a state of dissolution. The authority passed into the hands of the national guards and the students' legion (the *Aula*). A rising of the people (May 15), in support of the central committee, formed from the national guards, which the government had attempted to dissolve, compelled its continuance, and also a revision of the electoral law, so as to convert the new diet into a constituent assembly. These proceedings led to the flight of the court to Innsbrück (May 17). An unsuccessful attempt of the government to break the power of the "Aula," resulted in the appointment of a committee of safety, to whose influence the government had to submit. A Slavic insurrection broke out in Prague after Easter, which was repressed with bloody severity by Prince Windischgrätz. While the emperor was thus lingering at Innsbrück, leaving Vienna in the power of the populace, and the Hungarians were pursuing an independent course, it was in Italy that the power of A. began to recover itself.

Radetzky had at first been reduced to the maintaining of a defensive position at Verona, against Charles Albert of Sardinia, who had declared war on A. at the outbreak of the revolution, and the forces that came to his aid from Tuscany, Rome, and Naples; and the foreign policy of A. was in such a state of discouragement, that negotiations were entered into under the mediation of Great Britain, offering the Lombards independence on moderate conditions. But in June, Radetzky took up the offensive, reduced in succession Vicenza, Padua, and other cities, and then turning against the chief Sardinian force, defeated it at Custozza (25th July), and drove it from the field. The fruits of the victory were the dissolution of Charles Albert's army, and a truce which again delivered Lombardy to Austria.

In the mean time, the government at Vienna was more powerless than ever. The emperor remained at Innsbruck, and the constituent diet was opened, July 22, by the archduke John, as his representative. But a new crisis was ripening in Hungary. The Croats, under their ban, Jellachich (q.v.), opposed the predominance of the Magyars, and refused obedience to the Hungarian government, which, under the Batthyanyi-Kossuth ministry, was pursuing a policy almost independent of Austria. Jellachich's resistance was officially condemned by the emperor, and he was threatened with deposition; but, as subsequently appeared, his conduct was secretly approved by the court. The archduke Palatine, Stephen, now left Hungary, after a last attempt at conciliation; and the emperor, who had returned to Vienna after repeated invitations, named count Lamberg commissioner, with the supreme command in Hungary. Lamberg, however, was murdered on the bridge of Pesth (Sept. 28). The Hungarian parliament was now dissolved, and the command given to Jellachich. But the parliament continued its sittings, and appointed Kossuth president of the committee of defense. When the imperial troops now began to march against Hungary, a frightful insurrection broke out in Vienna (Oct. 6), which was attributed to Hungarian instigation. The arsenal was stormed, and the war-minister, Latour, murdered; the court fled to Olmütz, a committee of safety was appointed, the armed populace organized, and the Polish gen. Bem put at the head of military affairs; while the diet wavered between royalty and revolution. In the mean time, the military forces had withdrawn, and joined Jellachich, in order to prevent the Hungarians coming to the aid of the Viennese. Windischgrätz now approached with an army, and declared Vienna in a state of siege. The attack began on the 23d of Oct., and after a resistance of eight days, Vienna surrendered.

Severe measures were then taken; and a number of leaders, among others, Robert Blum (q.v.), were condemned and shot. The diet now met at Kremsir, and a new ministry was formed, into which prince Schwartzenberg, count Stadion, Bach, Bruck, and others entered. But the vigorous policy thought to be necessary for the restoration, and advocated by the archduchess Sophia, was not responded to by the easy nature of Ferdinand I. Accordingly, the emperor abdicated, Dec. 2, as did also the archduke Franz Karl, and the latter's son, Franz Joseph (q.v.), was declared emperor.

In winter, Windischgrätz entered Hungary, and began the Hungarian war. After the encounters at Raab and Babolna, Ofen was besieged (Jan., 1849), and the Hungarians retired beyond the Theiss, and had time to organize themselves under such able leaders as Görgei and Klapka, and to prepare for the struggle of the following summer.

In the mean time, important events took place elsewhere. In Mar. (21–23), Radetzky made his rapid and decisive campaign, which, by the victory of Novara, led to the abdication of Charles Albert, and an indemnification for war expenses from Sardinia of 15 million lire. With the surrender of Venice, which took place in Aug., the subjugation of Italy was complete.

At Kremsir, the diet proving intractable, was dissolved, Mar. 4, 1849; and a constitution was granted (*octroyirt*), with two elective chambers, responsible ministers, and other constitutional provisions. In the national assembly at Frankfurt, A. opposed the project of a confederated state under the leadership of Prussia, and managed to thwart the conferring of the empire of Germany on the Prussian king (Mar., 1849).

In Hungary, the Magyars, though the Germans and Slaves within the country itself were hostile to them, began the campaign with decided success. Bem conquered Transylvania in spite of Russian aid; and the rest of the Hungarian army advancing westward in spring, were successful against the imperial forces at Szolnok and Waitzen. Windischgrätz was replaced in the command by Welden, but the imperial cause was not improved. Kossuth's hopes rising, he proclaimed the deposition of the house of Hapsburg, and virtually made Hungary a republic. By May, Pesth and Ofen were again in the hands of the Magyars; and although gen. Welden was recalled, and the command given to Haynau, there was little prospect of success against the Magyars, if a treaty with the czar had not brought the aid of a Russian army under Paskewitsch. The Austrians still suffered several reverses, and the Hungarians performed splendid feats of arms, such as Görgei's victory at Waitzen, and Klapka's sally from Komorn; but from June, the war on the whole began to be more favorable to A., whose forces were well managed by Haynau and Jellachich; and the intervention of the Russians brought an irresistible weight of numbers against the Magyars. After the affairs of Szegedin and Debreczin, Haynau's engagements on the Theiss, and the raising of the siege of Temeswar, it was in vain that Kossuth transferred the dictatorship to Görgei. Görgei, whether from treachery, as the other Magyar leaders maintain, or from necessity, as he himself avers, laid down his arms to the Russians at Vilagos (Aug. 13). The surrender of Komorn, in Sept., completed the subjugation of Hungary, which was treated as a conquered country, and the officers taken in Arad were dealt with by Haynau with a bloodthirsty rigor.

A. was now free to attend to politics, internal and external, and the spirit of the restoration soon showed itself. One important fruit of the revolution was retained—the liberation of the soil from the burdens and trammels of feudalism. All other liberal concessions very soon disappeared For a time, the forms of the constitution of Mar., 1849, were retained; but the rigorous military government and the surveillance exercised over the press, showed the tendency of things. The fundamental principles of the constitution turned out to the profit only of the Catholic church, which got rid of the placetum regium. In the beginning of 1851, Schmerling and Bruck, the liberal element of the ministry, retired; and in Aug. appeared a number of imperial decrees rendering the ministers accountable to the emperor alone. At last, Jan. 1, 1852, it was announced that the constitution and the fundamental rights were abolished, trial by jury set aside, the old press law revived, etc. This was followed by still greater concessions of influence to the clergy. The emperor did not conceal his predilection for absolute military government. All this was not effected without manifestations of discontent. The fires of revolution were still smouldering in Hungary and Italy; and in Lombardy, though still under strict military law, a tumult broke out, Feb., 1853, in which a number of officers and soldiers were stabbed. The finances, too, notwithstanding vigorous measures for improving the material resources of the country, continued in a bad state, so that incessant loans were required to cover the current deficit.

On the confused arena of German politics, the struggle for ascendency was kept up between A. and Prussia. In Oct., 1850, the two powers were armed and ready to come to blows; but the bold and determined policy of Schwartzenberg prevailed, and Prussia gave way. The points in dispute it might be difficult for any but a German to understand, even if it were worth trying. See GERMANY, HESSE-CASSEL. The result was that Prussia's scheme of a union was given up, and also A.'s admission with all her territories into the German confederation; and in 1851, the old diet was restored. After the death of Schwartzenberg, the foreign policy of A. was more conciliatory, and her interference in German affairs less dictatorial. Prussia and A., after Dec., 1852, were more friendly, on the whole, though the war in Italy gave rise to considerable ill-feeling between the two powers. In Feb., 1853, a commercial treaty was concluded, which was of the utmost consequence to the prosperity of A., as removing a great part of the obstructions to her commerce with the rest of Germany.

In 1853, a difference took place between A. and Turkey, which formed, as it were, a prelude to the war in the Crimea. In the quarrel between the Montenegrins and the porte, A. took the part of the Montenegrins; she had also complaints as to the infringement of rights possessed by her on the Adriatic coast, and regarding the treatment of Christians in Turkey. The threatening mission of count Leiningen, Feb., 1853, procured redress of these grievances. As if following up this movement, Russia came forward as the special protector of the Greek Christians of the Ottoman empire, and made demands on the porte which were held inconsistent with his sovereign rights. It was the interest of A., as well as of the rest of Europe, to maintain the integrity of the Ottoman empire; but although she united with England and France in endeavoring to settle the question by negotiation, when the war broke out, her peculiar relations to Russia led her to remain neutral during the contest.

The conduct of A. in Italy, especially after 1849, was such as to make that country a "standing menace to Europe." The government of A. in that portion of Italy of which she obtained possession by the treaty of 1815, was far from satisfactory; but what was chiefly complained of by the other powers was her interference in the affairs of the independent states of the peninsula. By means of secret treaties (copies of which were laid before the British houses of parliament this year, 1859), A. obtained a most undue influ-

ence in Parma, Tuscany, Modena, the States of the Church, and in the kingdom of the Two Sicilies. That influence was of course exercised in the interests of despotism, and in opposition to the welfare of the people, whose wishes their rulers, backed by Austrian troops, were enabled to set at defiance. The position of A. in Italy was canvassed at the meetings which followed the signing of the treaty of peace at Paris in 1856, but nothing resulted from the discussions. Sardinia seeing herself gradually environed by, and afraid to fall a victim to the prevailing Austrianism, after all remonstrances of a peaceful kind had failed, began to arm. A. demanded her immediate disarmament, on pain of war; but Sardinia, whose army was swelled with volunteers from every part of the peninsula, and who had previously entered into a treaty, offensive and defensive, with France, refused. A. accordingly commenced hostilities by crossing the Ticino on the 29th of April, 1859. On the 3d May, France, as the ally of Sardinia, formally declared war against A.; but in anticipation of what was to follow, she had several days before dispatched troops into Piedmont. The Austrian troops were beaten in every engagement that followed, and so effectually, that on the 6th July, the emperor, who latterly had taken the chief command of his army, was fain to conclude an armistice with the emperor Napoleon, who also commanded in person. On the 12th of the same month, the two potentates met at Villafranca, and agreed to come to terms of peace, the chief conditions of which were to be the cession of Lombardy to Sardinia. See ITALY. In 1866 a short and bloody war occurred between A. on the one hand, and Italy and Prussia on the other (see GERMANY), issuing in the cession of Venice to Italy, and the dual reorganization of the empire as described above. Since then, the Sclavonic Bohemians have continued to struggle in vain for the separate crown rights of their ancient kingdom. The part taken by the government in the Russo-Turkish war of 1877–78, which led to the occupation of Bosnia and Herzegovina, provoked very bitter feeling in the Hungarian section of the empire.

AUSTRIAN LIP, the thick lip so characteristic of the Hapsburgs, derived from Cymbarga, a niece of a king of Poland, who was noted for beauty and unusual strength.

AUTAU'GA, a co. in central Alabama, on the A. river; 650 sq.m.; pop. '80, 13,113—7292 colored. The soil is fertile; the surface uneven. There are several cotton and other factories. The Selma, Rome, and Dalton railroad touches the w. part of the county. Co. seat, Prattville.

AUTEUIL, formerly a country village at the entrance of the Bois de Boulogne, now inclosed within the fortifications of Paris. It is known as the residence of famous literary men—such as Boileau and Molière.

AUTHENTIC (Gr.) is a term applied to any writing or document, the contents of which may be depended upon for their truth or accuracy. It is frequently employed as synonymous with *genuine*, though a distinction has been drawn, especially by Biblical critics, between the two words. *Authenticity*, it is said, refers to the statements made by an author; *genuineness* to the authorship itself. Thus, we speak of a *History of England* as *A.*, when the narrative is admitted to be correct; and we say of such and such a gospel or epistle that it is *genuine*, when we are convinced that it is the composition of the writer to whom it is attributed. See bishop Watson's *Apology for the Bible*, and dean Trench's *Study of Words*. This distinction, however, appears to be artificial rather than real; that is to say, it does not inhere in the original signification of the words.

AUTHENTICS, the Latin translation of Justinian's *Novellæ* and a literal conveyance of the original. The term was applied to extracts from the decisions of the "Novellæ" by which previous decisions were set aside or modified. Two German emperors, Frederick I. and II., put forth A. in their own names, and ordered them to be inserted in the Justinian code.

AU'TO, entering into many compound scientific terms of Greek extraction, is the Greek pronoun *self*. In some compounds, it denotes the agent or subject, as in *autocrat, automaton, autonomy;* in others, the object, as in *autobiography, autocratic, autodidactic;* in others, again, a mere reference to the subject, as in *autochthonous*. This variation in the grammatical relation of *A.* sometimes occasions ambiguity in the meaning of the compound. Thus, *autograph* means both a machine that writes of itself, and also a writing done with the person's own hand; *autocracy*, both the mastery over one's self, and the sole rule or absolute authority over a people or state.

AUTOCH'THONES, according to Greek mythology, the first human pair who appeared in the world, and who, as the name implies, were believed to have sprung from the earth itself. Instead of only one pair for all lands, each district of Greece had its own A., who were supposed to have sprung from rocks, trees, or marshy places; the most peculiar and wide-spread belief being that which traced the origin of mankind to the otherwise unproductive rocks. Was there a shadow of Darwinism in the legend that the A. of Athens, Erysichthon, had legs like a serpent; or did it merely indicate that they were supposed to have come from a bog? The earth-born giants who made war upon the gods also had serpent legs. In Thebes the race of the Sparti were said to have sprung from a field sown with dragon's teeth, and the Phrygian Corybantes to have been forced out of hill-sides, like trees, by Rhea, the great mother. These originals of men in various countries were supposed to have lived like animals, in caves and woods, till by the

help of gods and heroes they reached a stage of civilization. A. is applied in a general way to indicate the original inhabitants of a country.

AUTOCRACY (Gr. *self-mastery* or *sole-mastery*) signifies that form of government in which the sovereign unites in himself the legislative and the executive powers of the state, and thus rules uncontrolled. Such a sovereign is therefore called an autocrat. Nearly all eastern governments are of this form. Among European rulers, the emperor of Russia alone bears the title of autocrat, thus signifying his constitutional absoluteness. —Kant used the word *A.*, in philosophy, to denote the mastery of the reason over the rebellious propensities.

AUTO DA FÉ (Port. Act of Faith) was the name given to the procession or ceremony that used to take place in Spain and Portugal at the execution of heretics condemned to death by the inquisition. It was generally held on a Sunday between Whitsunday and Advent, very often on All-saints day. At dawn, the dismal tolling of the great bell of the high church gave the signal to begin the drama of the day; for as such it was looked upon by the people, who thronged to it in troops, believing that they did a good work in merely looking on. Men of the highest rank reckoned it prudent to give their countenance to the "holy" tribunal at these processions, and even grandees of Castile did not disdain to make themselves familiars of the inquisition. The procession was led by the Dominicans, carrying the flag of the inquisition; next followed the penitents, on whom only penance had been laid; behind them, and separated by a great cross which was borne before, came those condemned to death—barefoot, clad in the sanbenito, and with a pointed cap on the head; then, effigies of the fugitives; and lastly, the bones of dead culprits, in black coffins, painted with flames and hellish symbols. The frightful train was closed by the army of priests and monks. The procession went through the principal streets to the church, where, after a sermon on the true faith, the sentence was announced. In the mean time, the accused stood before a crucifix with extinguished torches in their hands. After the sentence had been read to them, an officer of the inquisition gave each of the condemned a blow on the breast with his hand, as a sign that they were given over by that tribunal to the secular power; on which a secular officer took them in charge, had them fettered, and taken to prison. A few hours afterwards, they were brought to the place of execution. If they yet, at the last, made profession of the Catholic faith, they were so far favored as to be first strangled; otherwise, they were burned alive, and with them the effigies and bones of the fugitive and dead culprits. As a rule, the king, along with his whole court, had to exalt by his presence the solemnity of the horrid transaction. The most splendid auto da fé took place at Madrid, under Charles II., in 1680; the last was held as recently as towards the middle of last century.

AUTOGRAPH (Gr.) is a term applied to what is written with the person's own hand, and not by an amanuensis. In relation to manuscripts, it is used in opposition to a *copy*. The collection of autographs has, especially in recent times, become an object of eager pursuit, and consequently they form a branch of literary trade. Their value is determined by the interest felt in the writer, the scarcity of such relics of him, and the contents of the writing. Besides portraits of famous persons, we wish, particularly in the case of distinguished contemporaries, to possess a specimen of their handwriting, or at least their signature, as the peculiarity of the style—the physiognomy of the handwriting —completes our knowledge of their personality. Lithography is particularly serviceable in this matter, not only by supplying fac-similes for biographical and historical works and for portraits, but also by multiplying impressions of collected autographs, such as have appeared in England by Smith, in Holland by Nathan, and in Germany by Dorow. But deserving mention before all others are the *Isographie des Hommes Célèbres* (3 vols. Par. 1828–30), to which a supplement appeared in 1839; and the *Autographen-Prachtalbum zur 200 jährigen Gedächtnissfeier des Westfälischen Friedensschlusses* (fol. Leip. 1848). We possess an uninterrupted succession of the royal autographs of England from king Richard II. downwards. Fac-similes are to be found in *Autographs of Royal, Noble, Learned, and Remarkable Personages, Conspicuous in English History, from the Reign of Richard II. to that of Charles II.*, by John Gough Nichols (fol. Lond. 1829). The preface to the work contains some interesting notices.

AUTOL'YCUS, a Greek astronomer and mathematician of Pitane in Æolia, about 330 B.C., wrote on the revolving sphere, and on the rising and setting of the fixed stars. Both works, printed in Dasypodius's *Propositiones Doctrinæ Sphericæ* (Strasb. 1572), contain, for the most part, only such propositions of spherical astronomy as can be solved by means of a globe; and, instead of presupposing the knowledge of spherical trigonometry, they seem rather to prove that A. himself was unacquainted with it.

AUTOM'ATON is derived from two Greek words signifying self-movement, and is usually applied to machinery constructed to represent human or animal actions. The construction of automata has occupied the attention of mankind from very early ages. Archytas of Tarentum is reported, so long ago as 400 B.C., to have made a pigeon that could fly. Albertus Magnus and Roger Bacon, in the 13th c., are said—but there is some dubiety about the matter—to have made respectively a porter to open the door, and a speaking head. In France, in the beginning of the 18th c., many persons busied themselves in the construction of automata; and among other things, a pantomime, in

five acts, was represented by actors moved by machinery. The most perfect A. about which there is absolute certainty, was one constructed by M. Vaucanson, and exhibited in Paris in 1738. It represented a flute-player, which placed its lips against the instrument, and produced the notes with its fingers in precisely the same manner as a human being does. In 1741, M. Vaucanson made a flageolet-player, which with one hand beat a tambourine; and in the same year he produced a duck. This was a most ingenious contrivance, the mechanical duck being made to conduct itself in every respect like its animated pattern. It swam, dived, ate, drank, dressed its wings, etc., as naturally as its live companions; and, most wonderful of all, by means of a solution in the stomach, it was actually made to digest its food! An A., produced by M. Droz, drew likenesses of public characters; and, some years ago, Mr. Faber contrived a figure, exhibited in various places, Edinburgh among others, which, by means of certain keys, was made to articulate simple words and sentences very intelligibly, but the effect was not pleasant. The chess-player of Kempelen was long regarded as the most wonderful of automata. It represented a Turk of the natural size, dressed in the national costume, and seated behind a box resembling a chest of drawers in shape. Before the game commenced, the artist opened several doors in the chest, which revealed a large number of pulleys, wheels, cylinders, springs, etc. The chessmen were produced from a long drawer, as was also a cushion for the figure to rest its arm upon. The A. not being able to speak, signified when the queen of his antagonist was in danger by two nods, and when the king was in check by three. The A. succeeded in beating most of the players with whom it engaged; but it turned out afterwards that a crippled Russian officer—a very celebrated chess-player—was concealed in the interior of the figure. The figure is said to have been constructed for the purpose of effecting the officer's escape out of Russia, where his life was forfeited. So far as the mental process was concerned, the chess-player was not, therefore, an A.; but great ingenuity was evinced in its movement of the pieces. M. Houdin, the celebrated conjurer, was the inventor of some striking automata.—See Hutton's *Mathematical Recreations; Memoirs of Robert Houdin.* Lond. 1859. Chapman & Hall.

AUTON'OMY (Gr. *self-legislation*) is the arrangement by which the citizens of a state manage their own legislation and government; and this evidently may, with certain restrictions, be the case also within limited bodies of the same people, such as parishes, corporations, religious sects. The term A. is used to designate the characteristic of the political condition of ancient Greece, where every city or town community claimed the right of independent sovereign action. The idea of two or more town communities sinking their individual independence, and forming the larger aggregate unity which we understand by a state, seems to have been intolerable to the Greek mind.

AU'TOPLASTY, in surgery, the operation of renewing a portion of the body that has been torn away, by reinforcement from other parts; thus, a nose may be built up by strips cut from the arm or elsewhere. The art appears to be very old, and was practiced in India ages ago. Probably it arose from the desire to conceal the fact of infamous punishment which very often consisted in cutting off the nose or ears. If immediately rejoined the parts would grow together, and to prevent this the portions cut off were destroyed. But it was reasoned that if the parts cut off would grow together, any live flesh would do so. It was possible, therefore, to recruit a nose by a strip from the forehead or elsewhere. Celsus speaks of A. with reference to the nose and lips, and in the 15th c. it was practiced by Calabrian surgeons. In our days various improvements have been made, and now almost any injured part of the body's surface may be restored, often almost perfectly, by this art. There are several methods: one is to loosen the skin near the injured part and turn it down over the wound; another is to take the skin from the fleshy part of the limbs; and a third is to detach the skin for some distance on all sides and gently draw it over the place to be mended. The last method is considered much the best.

AU'TOTYPE, one of the names given to a peculiar kind of photographic print. Gelatine, to which bichromate of potash has been added, has the property of being, like paper, treated with certain salts of silver, sensitive to light, but in a different way. Light renders the bichromated gelatine insoluble, so that by the use of an ordinary photographic negative, we can produce a picture on the gelatine by exposure to light, as in the ordinary photographic printing process (see PHOTOGRAPHY). The picture so obtained is developed by removing with hot water those portions of the gelatine which have not been acted upon. Two groups of processes are founded on this property of bichromated gelatine. In the one, the gelatine is used for every copy of the picture; while in the other, it is only used to produce one picture, which is then made by various devices to serve as a printing matrix for throwing off, by mechanical means, many impressions. What is called carbon-printing comes into the first group, and an autotype is one kind of a carbon print. It is produced by simply mixing carbon or other pigment with bichromated gelatine, coating a sheet of paper with the mixture, and then exposing it to light under a negative as above described. When no pigment is used, the picture is merely in relief and depression, but the addition of carbon gives it ordinary light and shade, so as to resemble a print in ink. There are, however, some niceties in the manipulation, which we have not room to detail.

In those processes where the gelatine picture serves only as a matrix, electrotypes, impressions in soft metal, or other kind of reverses, are made, from which impressions can be taken mechanically, in any kind of printing ink. Photo-galvanography and the Woodburytype belong to this group.

AUTUMN, astronomically, the third season of the year; in the northern hemisphere covering the period from the sun's crossing the equinoctial, at the autumnal equinox, Sept. 22, till it is on the tropic of Capricorn, at the winter solstice, Dec. 22. Popularly, the A. in America is the three months of Sept., Oct., and Nov.; and in England Aug., Sept., and October. The American autumn is often considered the most delightful part of the year. S. of the equator the A. extends from the vernal equinox, Mar. 20, to the summer solstice, June 20.

AUTUN (Bibracte, Augustodunum), a t. in France, department of the Saône-et-Loire, in the Burgundian district of Autunois. Pop. '76, 11,358. It is situated on the river Arroux, is the seat of a bishop, and has a fine cathedral. Cloth, carpets, leather, stockings, and paper are manufactured in the place.—The ancient Bibracte was the chief city of the Ædui, and had a much-frequented Druid school; and at a later period, under the Romans, when it got the name of Augustodunum, it was no less famous for its school of rhetoric. A. was pillaged by the Saracens in 725, and nearly destroyed by the Normans in 888. There still exist at A. many ruins of Roman temples, gates, triumphal arches, and other antiquities. At the council of A. (1094), king Philip I. was excommunicated for divorcing his queen, Bertha.

AUVERGNE, a southern central district of France, was before the revolution a separate province, composing almost exclusively the modern departments of Cantal and Puy-de-Dome. Between the Allier and the upper course of the Dordogne and the Lot, A. rises into a highland region, having Bourbonnais, Limousin, and Rouergue, as terraces of descent into the western plains, while on the e. it joins the Cevennes and the southern highlands. Not only do the cone and dome-like shapes of the summits betray a volcanic formation, but also the great masses of basalt and trachyte that break through the crust of granite and gneiss, render it probable that this was a chief focus of plutonic action. Among the summits that have apparently been at one time volcanoes, the most remarkable are Cantal (6093), Mont-d'Or (6188), Puy-de-Dôme (4806), and Pariou; the latter, adjoining Puy-de-Dôme, is basin-shaped on the top, and one of the finest specimens of an ancient and extinct volcano; all are now covered with verdure. A. falls naturally into two divisions—upper A., to the s., and lower A., to the n.; in which last the valley of Limagne, on the left bank of the Allier, is distinguished for extraordinary fertility. The climate is colder in the mountainous districts than the southern position, with a less elevation, would lead us to expect, and is remarkable for furious winds and violent thunder-storms; but in the deep valleys the heat of summer is often oppressive. The lava-covered plateaus are desert, but the pulverized volcanic earths that cover the slopes and valleys form a rich and fruitful soil, as is shown by the crops of grain, garden produce, fine fruits, wine, abundance of chestnuts in the s., and of walnuts in the n., as well as by extensive thriving forests, along with flax and hemp fields and meadow-lands, in the poorer districts. Agriculture is in a rather neglected condition; but the breeding of cattle, especially of mules, is well managed. A. produces iron, lead, copper, antimony, and coal, and is rich in mineral springs.

The Auvergnese are a highland people, rude in their manners, poor, ignorant, at the same time honest and kind, though not free from the propensity to revenge. They live by cattle-keeping and agriculture, and by going to Paris as laborers. Domestic manufactures, therefore, remain confined to weaving, tanning, and paper-making. A. has, however, produced distinguished men. It was the native place of statesmen and warriors of the 15th and 16th centuries; and also of the Arnauld (q.v.) family, so distinguished in the history of Port Royal and of Jansenism. In more recent times, Lafayette and Polignac may be named. Chief towns, Clermont and Aurillac (q.v.). The country derived its name from the Averni, who long defended their fastnesses against Cæsar, as later against the Goths, Burgundians, and Franks, with whom they at last coalesced.

AUXERRE (anc. *Autissiodorum*), chief t. of the dep. of Yonne, France, stands on the Yonne, 90 m. s.e. of Paris. It is situated on the slope of a hill, in a rich and beautiful district abounding in vineyards. The city is mostly ill built; the streets are narrow, crooked, and dirty; but its aspect from a distance is very imposing, the most prominent feature being the cathedral church of St. Stephen, a grand and beautiful edifice which dates partly from the 13th century. The chapter of A. was once one of the richest in France. The churches of St. Germain and of St. Pierre (16th c.) are fine and interesting buildings. There is a curious old clock-tower over a gate-house, with an ugly skeleton spire of iron bars. The ancient walls of the city have been converted into boulevards. A. was a flourishing town before the Roman invasion of Gaul. It successfully resisted the Huns under Attila, who only ravaged its suburbs. Clovis took it from the Romans. After his death, it became part of the kingdom of Burgundy. The English took it in 1359, but it was retaken by Du Guesclin. Charles VII. gave it up to the duke of Burgundy. It was finally united to the kingdom of France by Louis XI. It has a communal college, a museum of antiquities, and a botanic garden. The principal manufactures are of strings for musical instruments, woolen cloths, hosiery, earthenware,

and leather. The Yonne becomes navigable here, and large quantities of Burgundy wines are sent down it to Paris; there is also a considerable export trade in timber and in charcoal. Pop. '76, 15,656.

AUXILIARY SCREW. See SCREW-PROPELLER.

AUXILIARY VERBS. See VERBS, CONJUGATION.

AUXONNE, a t. in France on the Saone, 17 m. s.e. of Dijon; pop. 5911. It is fortified, and has an arsenal and barracks, and manufactories of woolen and nails.

AUZOUT, ADRIEN, d. Rome, about 1693; a French astronomer. He and Picard applied the mural quadrant to the telescope, and A. made and applied a movable wire micrometer, by means of which he measured the daily variations in the moon's diameter, which Kepler had explained. A. was also an optician and a manufacturer of telescopes. He was one of the original members of the academy of science, founded in 1666.

AUZOUX, THÉODORE LOUIS, b. France, 1797; an anatomist and physician. He was known as the inventor of the method of making permanent models of anatomical preparations in *papier machie*, the special advantages of which are: lightness and strength of material; enlargement of minute parts; colors after nature; and the ease with which models may be dissected and put together in the smallest particulars. In 1825, he completed his invention and established a manufactory at St. Aubin. He has received many prizes up to the cross of the legion of honor. Some years ago he lectured, using his own models in illustration. He is the author of several works on surgical and medical themes.

AVA, a ruined city of Burmah, of which it has repeatedly been the capital, the honor having been transferred again and again between it and Monchobo, Sagaing, Amarapura, and Mandalay, the present capital. It stands in lat. 21° 51′ n., long. 95° 58′ e., on the bank of the Irawaddy, here about 4000 ft. broad. The river at this point receives two affluents, and these being joined by a canal, the city is rendered circumnavigable. The name is a Hindu and Malay corruption of Aengwa or Aaen-ua, meaning *fish-pond*, given it from being built where there were formerly fish-ponds, of which some still remain; but in official documents it is designated as Ratnapura, i.e., city of pearls. The city, which was 8 or 10 m. in circumference, was surrounded by walls and ditches. A. is now almost a desert, having been reduced to ruins by an earthquake in 1839.—On the opposite bank stands Sagaing, which has twice been the seat of government. The united pop. of the three cities of A., Sagaing, and Amarapura was at one time estimated at 400,000.

A'VA, ARVA, YAVA, or KAVA, *Macropiper methysticum*, a plant of the natural order *piperaceæ* (q.v.), possessing narcotic properties. Until recently, it was ranked in the genus *piper* (pepper). It is a shrubby plant, with heart-shaped, acuminate leaves, and very short, solitary, axillary spikes of flowers. It is a native of many of the South-sea islands, where the inhabitants intoxicate themselves with a fermented liquor prepared from its root or (more accurately) rhizome. The rhizome is thick, woody, rugged, and aromatic. A tincture of it is useful in chronic rheumatisms. The intoxicating liquor is prepared by macerating it in water. The savage Tahitians were accustomed to prepare it in a very odious manner; much as the Indians of the Andes prepare *chica* or maize beer—chewing the root, depositing it in a bowl, straining through cocoa-nut husk, and mixing with water or cocoa-nut milk, after which fermentation speedily ensues. The taste is unpleasant to those unaccustomed to it, and has been likened to that of rhubarb and magnesia. The intoxication is not like that produced by ardent spirits, but rather a stupefaction like that caused by opium. It is succeeded by a copious perspiration. The habitual use of A. causes a whitish scurf on the skin, which, among the heathen Tahitians, was reckoned a badge of nobility, the common people not having the means of indulgence requisite to produce it.—The leaf of the A. plant is in some places used with the betel-nut, instead of that of the betel-pepper.

AVADU'TAS, a sect of self-torturing fanatics among the Hindus, who put their bodies to such extremes of pain as to produce deformity. Begging is their means of subsistence.

AVALANCHES are masses of snow or ice that slide or roll down the declivities of high mountains, and often occasion great devastation. They have various names, according to their nature. Drift or powder avalanches (*staub lavinen*) consist of snow, which, loose and dry from strong frost, once set in motion by the wind, accumulates in its descent, and comes suddenly into the valley in an overwhelming dust-cloud. A. of this kind occur chiefly in winter, and are dangerous on account of their suddenness, suffocating men and animals, and overturning houses by the compression of the air which they cause. Another kind of A. resembles a land-slip. When the snow begins to melt in spring, the soil beneath becomes loose and slippery; and the snow slides down the declivity by its own weight, carrying with it soil, trees, and rocks. The greatest danger is where elevated tracts of moderate declivity are separated from the valleys by precipitous walls of rock; the softened snow of spring beginning to roll or slide on these slopes, is hurled over the precipices with fearful force into the valleys. The very wind

caused prostrates forests and houses. Ice A. are those that are seen and heard in summer thundering down the steeps, e.g., of the Jungfrau. They consist of masses of ice that detach themselves from the glaciers in the upper regions. They are most common in July, Aug., and Sept.

AVALLON (anc. *Aballo*), a t. of the dep. of Yonne, France, 26 m. s.e. from Auxerre, on a steep hill of red granite, nearly surrounded by the Cousin, which here flows through a ravine. Around the town runs a broad terrace-walk, shaded with lime-trees, about 500 ft. above the bed of the river. The surrounding country is fertile, yielding much wine and grain, and abounding also in excellent pastures, on which great numbers of cattle and sheep are fed. The town is generally well built, and has broad and clean streets. The church is ancient, and has a curious Romanesque portal. Manufactures of various kinds are actively carried on, particularly of woolens and paper; and there are distilleries, tanneries, glass-works, etc. There is also a considerable trade in the produce of the neighborhood. A. is a very ancient town, of Celtic origin. It was sacked by the Saracens in 731 A.D., and by the Normans in 843; taken by Charles VII. in 1433, retaken by Philip the good, duke of Burgundy, in 1455; and pillaged by the troops of the league in 1593. Pop. '76, 5337.

AVA'LOS, FERDINANDO FRANCESCO D', 1490-1525; Marquis of Lescara, and one of Charles V.'s Italian officers. When a mere boy he married Vittoria Colonna, to whom he was affianced when she was but four years old. At the battle of Ravenna he was wounded and made prisoner, but was soon ransomed, and gained distinction at the fight at Vicenza, 1513; at Milan, which he took from France in 1521; at Como; and in several other engagements, including the plundering of Genoa. He won the highest distinction in the great victory over Francis I. at Pavia, 1525, and was made generalissimo. But he ruined his fame by joining the conspiracy to drive the Germans and Spaniards from Italy, and then betraying the plot to the emperor. His reward was to have been the crown of Naples, but his wife induced him to decline it.

AVAN'TURINE, a variety of quartz, remarkable for the brilliancy with which it reflects light, which is supposed to result from small particles of mica inclosed in it. It is of a yellow, red, or brown color. It is used in jewelry, but is not so much valued as amethyst or Cairngorm stone. It is found in India, Spain, and Scotland.

AVA'RI, a tribe of eastern origin, made their appearance 100 years later than the Bulgarians, in the countries about the Don, the Caspian sea, and the Volga. One part of them remained at the Caucasus, another part pressed forward (about 555 A.D.) to the Danube, and settled in Dacia. Here they served in Justinian's army, and assisted the Lombards to overturn the kingdom of the Gepidæ; and, about the end of the 6th c., under the mighty Khan Bajan, they conquered Pannonia. Later they made themselves masters of Dalmatia; made devastating incursions into Germany, as far as Thuringia; and into Italy, where they warred with the Franks and Lombards, and extended their dominion over the slaves living on, and northwards from, the Danube, as well as over the Bulgarians as far as the Black sea. These nations at last rose against them, and, in 640 A.D., drove them out of Dalmatia. Confined to Pannonia, they were subdued by Charlemagne, and well-nigh extirpated by the Moravians, so that, after 827, they disappear from history. They usually surrounded their settlements with fortifications of stakes driven into the ground, and earth, of which traces, under the name of Avarian rings, are yet found in the countries formerly occupied by them. The results of the most recent criticism show that, in all probability, the A. belonged to the same great Turanian stock as the Huns, and that their original residence was the land lying e. of the Tobol, in Siberia.

AVAST, one of the peculiar terms employed on shipboard. It is a command to stop or cease in any operation going forward—such as, "avast heaving."

AVATAR' primarily signifies, in Sanscrit, a descent, but is specially applied to the descent of a Hindu deity upon the earth in a manifest shape, either for beneficent of for retributive ends. It is thus almost synonymous in its signification with the Christian term *incarnation*. The word is sometimes rhetorically employed in English literature. The avatars of Vishnu (q.v.) are the most famous in Hindu mythology.

AVAT'CHA, a mountain and bay of Kamtchatka. The bay is on the e. coast, being by far the best harbor of the whole peninsula, and containing the capital city of Petropaulowsk (q.v.). The mountain, 9055 ft. in height, is about 20 m. to the n., and not far from the sea, in lat. 52° 15′ n., and long. 158° 50′ e. It is a volcano with two craters—one at the summit, and the other rather more than half-way up, on the seaward side.

AVEBURY, A'BURY, or A'BIRY, a small village of Wiltshire, situated in n. lat. 51° 25′, and w. long. 1° 50′, 25 m. n. of Salisbury, and 6 w. by n. of Marlborough. It is a place of no importance in itself, having a pop. of 769; but it is remarkable as the site of the largest so-called Druidical temple in Europe—in fact, occupying the most of the sacred inclosure itself—and as having in its neighborhood several remarkable barrows and cromlechs of remote antiquity.

What is called the temple occupies a flat area of ground on the s. of the Kennet, a diminutive tributary of the Thames. It consists, or rather consisted, of a hundred large

blocks of stone, placed on end in a circular form, around a level area of about 470 yards in diameter, bounded by a deep ditch and a high embankment forming the inclosure. There are also the remains of two small circles of stones within the inclosure, supposed to be inner temples. Of these, one consisted of two concentric circles of 43 upright stones, having a single stone near the center; the other, a similar double circle of 45 stones, to the n.w. of the former, with three large and high blocks in the center. The stones that remain of this ancient work are not of uniform size; they measure from 5 to 20 ft. in height above the ground, and from 3 to 12 in breadth and thickness.

The embankment, which is broken down in several places, had originally two entrances to the temple, eastward and westward, from which issue two long walks, bending round to the southward, each furnished with a range of blocks on either side similar to those of the temple itself. These avenues are each upwards of a mile in length, the width varying from 56 to 35 feet. That which issues to the e., or rather s.e., after turning southward, bends near its extremity to the s.e. again, and closes on a knoll called Overton hill in two concentric oval ranges of blocks. That which issues to the w. also bends to the s., and then to s.w., ending in a point with a single block.

Of the surrounding antiquities, that which appears most closely connected with the temple is a large barrow, or lofty conical mound, called Silbury hill, lying due s. of it, at a distance of three quarters of a mile. It is situated nearly midway between the two avenues, in the line of the ancient Roman road between London and Bath. Close to the base, it measures 2027 ft. in circumference; the sloping height is 316 ft.; the perpendicular height, 170 ft.; the diameter of the level area at the top, 120 ft.; the space covered by the whole work, over 5 acres. What proves the structure to have been more ancient than the time of the Romans, if such proof were necessary, is that the Roman road, as it comes from the w., is straight for several miles till it reaches Silbury, when it bends round it to the s., and again proceeds in a direct line to Marlborough.

About a mile n. of A. there are remains of a large cromlech, the stones of which have been overturned; and about 3 m. e. there is another, which has two upright blocks standing apart, with a larger one surmounting them. In the neighborhood, all round the Marlborough downs, there are remains of earthworks and upright stones, and the sites of other antiquities now nearly obliterated.

Very little was known of A. temple and the antiquities in its vicinity till the year 1740, when Dr. Stukeley, a somewhat fanciful antiquary, published his work, *Stonehenge and Abury, Two Temples Restored to the British Druids;* although Aubrey, an ardent student of antiquarian lore, had written an account of them in 1663, by command of Charles II., the manuscript of which still exists. None of the earlier topographers or antiquaries appear to have left any description of them. When Sir Richard Hoare, in collecting materials for his *Ancient Wiltshire*, made his examination of them in 1812, 72 years after the appearance of Stukeley's work, and 164 after the first survey by Aubrey, a great number of the stones had disappeared, and in many places it was difficult to trace out even the plan of the works. In 1849, in order to satisfy the curiosity of the lovers of antiquity as to the nature and intention of the great barrow, Silbury hill, a tunnel was cut to its center, but nothing was discovered to throw light on the subject. Some modern archæologists altogether reject the conclusions of Stukeley and his followers, and call for proof of any connection between the Druids and the stone circles which it has been the fashion for the last century to call Druidical.

AVE'IRO, a maritime t. of Portugal, in the province of Beira, between Oporto and Coimbra, situated in an unhealthy locality at the mouth of the Vouga, which forms a wide but shallow harbor, is the see of a bishop, has 5000 inhabitants, and trades in oil, wine, oysters, sardines and other fish, oranges, and sea-salt.

AVE'IRO (anc. *Avreium*), a city of Portugal, in the province of Beira, 31 m. n.w. from Coimbra. It is situated on the Ria d'Aveiro, a salt lake or lagoon, extending five leagues to the n., and separated from the sea by a narrow bar of sand. Into this lake the Vouga, the Antua, and some smaller rivers flow. During a year of great drought, the sand-bar closed up the seaward opening, a vast mass of sand quickly accumulated, and the low grounds were inundated, the water of the rivers escaping only by filtering through the sand. In summer, the lake thus made is partially dried, and marshes are formed, the effluvia from which have rendered the city very unhealthy, so that its pop. has fallen from 14,000 to 5000, its present number. In 1808, the government opened a new passage through the sand-bar, and executed other works which dried part of the inundated grounds, and improved the sanitary conditions of the city, which, however, are far from being good. A. is a bishop's see, but its cathedral is "a squalid and tawdry room, up one pair of stairs." It is a place of considerable activity; it has manufactures of earthenware, but the chief article of trade is salt, which is made in the marshes in summer. Other important articles of trade are fish, wine, oil, and oranges. The anchovy, sardine, herring, and oyster fisheries are actively prosecuted. The city has a deserted appearance. Its streets are narrow and dark, and seamed with filthy canals of salt-water.

AVEL'LA (anc. *Abella*), a t. of central Italy, in the province of Avellino, 20 m. e.n.e. from Naples. It is delightfully situated in a hilly district, and commands a very extensive view. A ruined castle marks the site of the ancient city, which was founded by one

of the Greek colonies from Chalcis, and was celebrated in Roman times for its apples and pomegranates. Virgil speaks of it as *malifera Abella*. Pop. of commune, 5228.

AVELLANE'DA, GERTRUDIS GOMEZ, DE, 1816–64; poet and novelist; the daughter of a Spanish naval officer. In 1840, she produced, in Madrid, a successful drama, *Leonicia*, and in 1845 was awarded a laurel crown for a poem praising the queen's clemency. Two vols. of lyrics, 8 vols. of prose, and 16 dramas are of her production.

AVELLI'NO (anciently, *Abellinum*), chief t. of the province of the same name in the s. of Italy. It is situated at the foot of monte Vergine, on which is the famous monastery founded by S. Guglielmo da Vercelli, on the ruins of a temple of Cybele, in 1119. Pop. 20,000. A. suffered greatly from earthquakes in 1694, 1731, and 1805. It has manufactures of woolens, paper, macaroni, and considerable trade in corn and hazel-nuts. The *nuces Avellanæ* were famous even in Pliny's time. Between A. and Benevento is the Val de Gargano, where the Samnites defeated the Romans in 433 A.U.C. Pop. of province, '71, 375,691.

AVELLI'NO, a province in s. Italy, 1409 sq.m.; pop. '71, 375,691. It is a mountainous region, but with fertile soil, yielding good harvests. It is watered by the Calore and Ofanto rivers. Chief t., Avellino.

AVÉ MARI'A, also ANGEL'ICA SALUTA'TIO, or the angelic salutation, are names given by the Roman Catholics to a very common form of address to the Virgin Mary. *Ave Maria* are the first two words of the prayer, in Latin, which is taken from the angel Gabriel's salutation (Luke i. 28): "Hail, Mary, highly favored, the Lord is with thee; blessed art thou among women, and blessed is the fruit of thy womb." In this form, according to an ordinance of Gregory I., the invocation was at first said by the priests during mass, on the fourth Sunday after Advent. With the extended worship of the Virgin since the 11th c., the A. M. appears as a lay-prayer of nearly equal use with the Paternoster, and was sanctioned as such at the end of the 12th century. Accordingly, not only did Urban IV. (1261) add the concluding words, *Jesus Christus, Amen*, but since the first half of the 16th c., the prayer began to receive, more and more commonly, as an addition to the old formula, what constitutes the conclusion of the modern form: "Holy Mary, mother of God, pray for us sinners, now and at the hour of our death, Amen." An edict of John XXII. (1326) ordains that every Catholic shall, morning, noon, and evening, at the warning of the bells, repeat three aves. This ringing of bells as a summons to morning, midday, and evening prayers, is retained in some Protestant countries, and is still called the A. M., or Angelus Domini. The aves are reckoned by the small beads of the rosary, which are hence called Ave Marias, while the large beads are devoted to the Paternoster. 150 Ave Marias form—after the 150 Psalms— a *Psalteriam Mariæ*, and are thought to possess high propitiatory power.

AVEMPACE (ABU BEKR MOHAMMED IBN JAHYA), probably b. in Saragossa near the close of the 11th c., d. at Fez, 1138; the earliest and one of the most distinguished Arab philosophers in Spain. He was a physician, mathematician, astronomer, and poet, though now known only from his metaphysical speculations. The most important of his works, and one noticed by Averrhoes, is *Regime, or Conduct of the Solitary*, which the author set forth as a system of rules by which man may rise from the life of the senses to the perception of pure intellectual principles, and may participate in the divine thought which sustains the world.

AVE'NA. See OAT.

AVENBRUG'GER. See AUENBRUG'GER.

AVENGER OF BLOOD. See BLOOD, AVENGER OF.

A'VENS. See GEUM.

AVENTI'NUS, JOHANNES THURMAYR, a scholar and historian, b. at Abensberg, Bavaria, where his father was a publican, in 1476. Having studied at Ingolstadt, he went to Paris, where he took the degree of M.A. He afterwards taught Greek and mathematics at Cracow, and poetry and eloquence at Vienna. In 1512, the duke of Bavaria called him to Munich, and intrusted him with the education of his sons. Here A. wrote his esteemed *History of Bavaria* (Annales Boiorum), a work which occupied him sixteen years. This work was not published until twenty years after his death, which took place in 1534, and then only with large portions, more true than pleasant, about the Romish church, excised. These, however, were all restored in Cisner's edition of 1580. A. wrote several other learned works.

AVEN'TURINE, the name of certain specimens of feldspar and quartz having the property of reflecting or refracting light in various colors from points inside the stone. In some cases the effect is produced by the presence of mica in small scales. A. is imitated by the Venetian glass makers, who outdo the original in beautiful effects. The name signifies "accident," and the discovery is said to have come from the dropping of brass filings into melted glass.

AVENZO'AR (ABU MERWAN ABDALMALEC IBN ZOHR), 1072–1162; a Spanish Arabian physician, pupil of his father. He made earnest efforts to reduce medicine to the plane of experimental science. Some of his works have been published, and one is spoken of by Averrhoes.

AVERAGE. If any number of unequal quantities are given, another quantity may be found of a mean or intermediate magnitude, some of the given quantities being greater, and others less, than the one found, which is called the average. The exact relation is this: that the sum of the excesses of the greater above the A. is equal to the sum of the defects of the less below it. If there are, say, 7 vessels unequally filled with sand, and if we take handfuls from the greater, and add these to the less, until the sand is equally distributed, then any one of the equalized measures of sand is the A. of the 7 unequal measures. If the quantites of sand in the several vessels are stated in numbers, as 5, 10, 12, 8, 11, 14, 3 oz., the A. is found by adding together the numbers, and dividing by how many there are of them—viz., 7. The sum being 63, this, divided by 7, gives 9 oz. as the A. The system of averaging is a very important and time-saving one. By averages, the farmer calculates the value of his crops; the grazier, the value of his cattle; and the forester, the value of his trees. Reflection, however, requires to be exercised in striking averages; otherwise, serious errors may be committed. If a farmer, for instance, has three lots of cattle, the first of which he averages at £25 a head, the second at £15, and third at £9, it might be thought that the A. of the whole stock made up of the three lots would be got by taking the mean of £25, £15, and £9—viz., $\frac{25+15+9}{3}$=£16⅓. But this would be correct only if there were an equal number of cattle in each of the lots. To get the real A. in case of the lots being unequal, he must multiply the A. of each lot by the number of cattle in it, add the three products together, and divide by the whole number of cattle in all three lots taken together. If we suppose 9 head in the first lot, 20 in the second, and 15 in the third, the A. is $\frac{25\times9+15\times20+9\times15}{9+20+15}$=£15.

AVERAGE (in marit. law). A rule was established by the Rhodian law (q.v.), and has prevailed in every maritime nation, that where a loss has been sustained, or expense incurred, for the general safety of the ship and cargo, a contribution should be made, in proportion to their respective interests, by the owners of the ship, freight, and goods on board; or, in modern times, by the insurers of these. To this contribution the name of *general A.* is given. The apparel, jewels, and other personal property of the passengers, not carried for purposes of traffic, and the seamen's wages and provisions, are not liable for any share in this contribution. Goods thrown overboard are now estimated at the price they would have yielded at the port of delivery at the time, freight, duties, etc., being deducted. See JETTISON. *Particular A.*, again, is the loss of an anchor, the starting of a plank, the leaking of a cask, the loss of goods washed from the deck, or the like, where the common safety was not in question, and where there is, consequently, no contribution. To losses of this description, the term A., though generally, is incorrectly applied. *Petty averages* are the duties of anchorage, pilotage, etc. If these occur in the ordinary course of the voyage, they are not loss, but simply part of the expense necessarily incurred. But if they have been incurred in extraordinary circumstances, and for the purpose of avoiding impending danger, they are a loss which is included in the general A., and covered by the contribution. *A. bond* is a deed which parties liable to a general A. are in the habit of executing, by which they empower an arbiter to value the property lost, and fix the proportion which shall be borne by each proprietor.

AVERDUPOIS. See AVOIRDUPOIS.

AVERELL, WILLIAM W., b. N. Y., 1830; a graduate of West Point; served on the frontier and in the war against the rebellion, rising from lieut. of mounted riflemen to maj.gen. He resigned in 1865, and in the next year was appointed consul-general to the dominion of Canada.

AVER'NUS, in Gr. *Aornos*, or "without birds," called now Lago d'Averno, is a small, nearly circular lake in Campania, Italy, situated between Cumæ, Puteoli, and Baiæ. It is about a mile and a half in circumference, and occupies the crater of an extinct volcano. It is in some places as deep as 180 ft., and is almost completely shut in by steep and wooded heights. The sulphureous and mephitic vapors arising from the lake were believed in ancient times to kill the birds that flew over it; hence, according to some, its Greek appellation. Owing to its gloomy and awful aspect, it became the center of almost all the fables of the ancients respecting the world of shades. Here was located Homer's Nekyia, or entrance to the under-world; here the Cimmerians are said to have dwelt—a people who lived in deep caverns, without ever coming into the light of day, explored metals, and imparted Stygian oracles; here also were placed the grove of Hecate and the grotto of the Cumean Sibyl. Agrippa caused the dense woods to be thinned, by which the place lost much of its wildness; and by his orders Cocceius constructed the famous tunnel through the mountain to Cumæ, a work of comparative ease, considering that the hills round about are composed of volcanic tufa. The lake was also connected in ancient times with the gulf of Baiæ.

AVERRHO'A. See CARAMBOLA.

AVERRHOES', properly, Ibn Roshd, or more fully, Abul-Walid Mohammed-Ibn, Ahmed-Ibn, Mohammed-Ibn-Roshd, the most famous of the Arabian philosophers, was

b. at Cordova, in Spain, in 1149. His father, who was chief judge and mufti, instructed him in Mohammedan jurisprudence. In theology and philosophy, he had Thophail for his teacher; and in medicine, Ibn Zohr, the elder. His talents and acquirements made him be appointed successor to his father, and afterwards chief judge in the province of Mauritania. Being accused, out of envy, of a departure from the orthodox doctrines of Mohammedanism, he was dismissed from his office, and condemned by the ecclesiastical tribunal of Morocco to recant his heretical opinions, and do penance. After this, he returned to his native place, and lived in great poverty until the caliph Almansor reinstated him in his offices, on which he went back to Morocco, where he died in 1198 or 1206. A. regarded Aristotle as the greatest of all philosophers. He translated and illustrated Aristotle's writings with great penetration; but the influence of the Alexandrine view laid down in the commentaries of Ammonius, Themistius, and others, is easily seen in his works, as in those of most of the Arabian philosophers. In opposition to the Arabian orthodox school, especially against Algazali, A. stood forth on the side of reason as the defender of philosophy. The Arabians called him, by way of eminence, the expositor (of Aristotle). Most of his writings are known to us only through Latin translations (Ven., 1489). The Arabic text of A.'s philosophical works was published at Munich in 1859 by M. J. Müller, whose German translation of the same appeared in 1875. His commentaries on Aristotle appeared in an addition of that philosopher's works (11 vols., Ven., 1560). He also wrote a sort of medical system, which, under the name of *Colliget*, was translated into Latin, and repeatedly printed. The philosophy of A. attained to importance in the Christian church as early as the 13th c., although his pantheistic doctrine of the unity of the active principle in the universe was often repudiated as an error, and astrology was characterized as Averrhoism. See Renan's *Averroës et l'Averroïsme.*

AVER'SA, a t. of southern Italy, in the province of Caserta, is situated between Naples and Capua, 9½ m. s. of the latter, in a beautiful district rich in oranges and wine. It is well built, with 20,000 inhabitants; has a cathedral, and a number of monasteries, in one of which Andrew of Hungary, the Darnley of Neapolitan history, was murdered with the connivance of his wife, the beautiful but guilty Joanna, queen of Naples; an excellent asylum for the insane, established by Murat; and a foundling hospital. A. was built in 1029 by the Normans on a territory ceded to them by duke Sergius of Naples, to be held in fief. About 2 m. from A. are still to be seen a few ruins of the Oscan city of Atella, famous as the birthplace of the satirical farces so popular on the Roman stage.

AVERY, Waitstill, 1745–1821; b. Conn.; a patriot of the American revolution. He was one of the signers of the Mecklenburg declaration, a member of the Hillsborough congress, of the North Carolina congress, and first attorney-general of the state. During the war he was in active service as col. of militia.

A'VĒS. See Birds.

AVEYRON, a river and department in the s. of France. The river rises near Severac-le-Château; flows, for the most part, in a westerly direction through the department of the same name; and, after a course of 90 m., falls into the Tarn—a feeder of the Garonne—below Montauban. It touches in its course the towns of Rhodez, Villefranche, and Negrepelisse.—The department of A. has an area of 3370 sq.m., and is one of the most mountainous parts of France. Situated between the highlands of Auvergne and the Cevennes, it slopes like a terrace s.w. to the Garonne, to the basin of which the department belongs. The principal rivers flow through the department from e. to w., and between these, several ramified offsets from the chain of the Cevennes traverse the country. The climate is healthy, but cold and raw, especially in the north and east. North of the Lot, only rye and oats are grown; in the rest of the valleys, other kinds of grain also thrive, as well as fruit, chestnuts, potatoes, and truffles. A third part of the land is unfit for cultivation, but affords excellent pasture for the numerous herds of cattle, goats, and sheep, which, along with the breeding of swine, form the principal resources of the mountaineers. 18,000 cwt. of cheese is sold yearly under the name of Roquefort cheese. The mineral wealth of the department is considerable. Coal, iron, lead, zinc, copper, vitriol, alum, and antimony are found in abundance, the mining, preparing, and sale of which form a principal means of support to the (1876) 413,826 inhabitants. Besides these, the principal employments are paper-making, cotton-spinning, tanning, the manufacture of woolen cloth and carpets, etc. The seat of the departmental courts is Rhodez, which is also a bishop's see.

AVEZAC, Auguste Geneviéve Valentin d', 1777–1851. He was a native of Hayti, a lawyer, and practiced with success in New Orleans. He had also practiced medicine. After service in the war of 1812 he settled in New York. President Jackson made him minister at the Hague in 1831, and he again filled the office in 1845–49.

AVEZZA'NA, Joseph, b. Italy, 1797, d. 1879. He fought under Napoleon, 1813–14; served in the Sardinian army in 1821, in which year he was sentenced to death and hanged in effigy for taking part in a students' insurrection in Turin. He fled to Spain, took part in a revolution, was captured, and escaped being shot only by the intervention of an English consul. Next he appeared in Mexico, where he fought the Spaniards and won the rank of gen., and was for a time commander-in-chief of the troops of the

republic. In 1834, he came to New York, married an Irish lady, and engaged in mercantile business. On the outbreak of the revolution of 1848, he returned to Italy, and was in command of the national guards of Genoa. After an unsuccessful struggle he went to Rome, then under republican government, and was made minister of war and commander-in-chief of the army. Being unsuccessful, he fled in disguise with Garibaldi to New York. In 1860, he went back and joined his old chief in the campaigns which resulted in freeing Italy from her petty tyrants. He was elected many times to the Italian parliament, and, when he died, was chief of the "Italia Irredenta" society. He was at one time U. S. consul at Genoa.

AVEZZA'NO, a t. of s. Italy, in the province of Aquila, 22 m. s. from Aquila. It is situated in a beautiful and fertile plain, covered with almond trees and vineyards, about a mile from lake Fucino. It has a large square, in which is a palace of the Colonna family. The town belongs to the Barberini family, whose baronial castle is a conspicuous object from the shores of the lake. The castle and some of the churches contain numerous ancient marbles with inscriptions recovered from the lake. The present town is about 2 m. distant from the site of Alba, the city of the Marsi, celebrated in the history of the Roman republic, which occupied the crest of a hill; a small village on the site still retains the name of Alba. Pop. 5200.

A'VIARY, a place for keeping birds. The arrangements of an A. depend upon the habits of its inmates, the climate suited to them, and other circumstances. A bird-cage is a domestic aviary. Aviaries on the largest scale are to be seen in zoological gardens.

AVICEBRON', or SALOMON BEN GABIROL, about 1045-70; a Jewish writer on philosophy and metaphysics, of Saragossa, Spain. Jews knew him only from his poems, but Christian schoolmen of the century following his time were much influenced by his works, in a Latin translation called *Fons Vitæ*, or *Sapientiæ*, wherein A. sets forth his idea of the objects of metaphysics.

AVICEN'NA, properly, Ibn Sina, or, more fully, Abu Ali Al-Hossein Ibn Abdallah Ibn Sina, a famous Arabian philosopher and physician, whose authority for many centuries passed for indisputable, was b. 980, at Charmatain, a village near Bokhara, where he received a very learned education. He studied with special fondness mathematics, astronomy, philosophy, and medicine. He was physician to several of the Samanide and Dilemite sovereigns, and also for some time vizier in Hamadan, but afterwards retired to Ispahan, and died during a journey of the Emir Ala-ed-Daula to Hamadan in 1037. He left a multitude of writings, among which his system of medicine, *Kanun fi 't-Tibb*, acquired the greatest reputation. It is distinguished less by originality than by an intelligible arrangement and judicious selection from the writings of the Greek physicians, at a time when the knowledge of Greek was not widely spread. A. himself knew the Greek writers only through Arabic translations. The Arabic text of the *Kanun*, and of several of his philosophical writings, among which those on metaphysics especially attracted the attention of the schoolmen, appeared at Rome, 1593, in 2 vols. The *Kanun* was translated into Latin by Gerardus Cremonensis, and repeatedly printed (Ven., 1595, 2 vols.). His philosophical writings have also appeared several times in Latin translations (Ven., 1490, 1523, 1564).

AVICEN'NIA, a genus of plants of the natural order *avicenneæ* or *myoporaceæ*, an order very nearly allied to *verbenaceæ* (q.v.), and almost exclusively confined to the southern hemisphere. The genus A. consists of trees or large shrubs resembling mangroves, and, like them, growing in salt-swamps. Their creeping roots, often curving for the space of 6 ft. above the mud before they stick into it, and the naked asparagus-like suckers which they throw up, have a singular appearance. *A. tomentosa*, the white mangrove of Brazil, has cordate ovate leaves, downy beneath. Its bark is much used for tanning. A green resinous substance exuding from *A. resinifera* is eaten by the New Zealanders. —The genus is named in honor of the Arabian physician Avicenna.

AVIC'ULA. See PEARL OYSTER.

AVIGLIA'NO, a t. of s. Italy, in the province of Potenza, 10 m. n.w from Potenza, on one of the head-waters of the Sele, near the bifurcation of the Apennines. It stands on the brow of a hill, part of which gave way, after long-continued rains in 1824, carrying with it a portion of the town. A. has an elegant collegiate church. The pastures of the neighborhood are celebrated for their large and fine oxen. Pop. '71, 11,336.

AVIGNON (*Avenio Cavarum*), a city of Provence, in the s. of France, capital of the department of Vaucluse, is situated on the left bank of the Rhone, which is here crossed by a long bridge. The pop. is (1876) 33,189; the streets are narrow and crooked. There is a multitude of churches and religious establishments, among which the cathedral on the Rocher des Dons and the church of the Franciscans, as well as the old papal palace and the tower Glacière, are distingulshed. The dominican convent now serves as a cannon-foundry. The city is the see of an archbishop, has a museum and picture-gallery, and several other valuable institutions. The university, founded in 1303, was abolished in 1794. A. has manufactures of silk, silk-dyeing, tanning, iron founding, etc., and is famous for its garden produce, its fruit, wine, honey, etc. The country about A. is delightful, and extremely fruitful in corn, wine, olives, oranges, and lemons.

—In A., Petrarch spent several years; it was here he saw Laura, whose monument is to be found in the Franciscan church. Vaucluse, which he has immortalized, lies about 3 leagues from Avignon. A. was the capital of the ancient Cavares, and presents many remains of the times of the Romans. In the middle ages, it formed, with the surrounding district, a co., which the popes, who had already received the co. of Venaissin as a gift from king Philip III., bought in 1348 from Joanna, queen of Naples and countess of Provence. The pope governed both counties through a vice-legate, and continued in the possession of them till 1790, when, after several stormy and bloody scenes, the city with its district was united with France. At the peace of Tolentino, 1797, the pope formally resigned A. and Venaissin. A. is celebrated in ecclesiastical history as being, for a time, the residence of the popes. By order of Philip IV., of France, pope Clement V. and six of his successors from 1309 to 1377, were obliged to reside there. It was afterwards the residence of more than one anti-pope. Two ecclesiastical councils were also held at A. (1326 and 1337): the first took into consideration the relation of the clergy to the laity; the other, the bad training of the clergy.

AVILA, a t. of Spain, capital of the province of A., in Old Castile, 53 m. n.w. of Madrid; pop. 6000. The Spaniards declare that its original name was Abula, and please themselves and amuse strangers with the belief that it was built by Hercules 1660 B.C. It is the birthplace of two highly remarkable persons—the first was the learned Alfonso Tostado de Madrigal, who d. in 1455, and whose doctrines (according to his biographer) were so enlightened that they caused the blind to see, though, in the opinion of Don Quixote, he was more voluminous than luminous; the second is "Our Seraphic Mother, the Holy Teresa, Spouse of Jesus," b. Mar. 28, 1515; she was made the lady-patroness of Spain by Philip III., and shares the honors of worship with St. James. A. is the see of a bishop, with a beautiful cathedral, and was at one time one of the richest and most flourishing cities of Spain. The university, which had been founded in 1482, and enlarged in 1638, was abolished in 1807. It was at A. that the nobles of Old Castile assembled in 1465 to depose king Henry IV., and raise his brother Alfonso to the throne of Leon and Castile. At A., also, was held the meeting of the so-called Third Estate, or of the Holy League, in 1520, under the leadership of Juan Padilla, to which nearly all the cities of Castile sent representatives.

AVILA, a province in Spain; 2569 sq.m.; pop. '70, 175,219. It is bounded n. by Valladolid, e. by Segovia, s. by Toledo, and w. by Salamanca. The n. part is level, with marl soil not especially productive, and has a climate ranging from extreme heat to extreme cold; agriculture is the chief occupation. The s. part is a mass of rugged ridges, with a few well-watered and fertile valleys; the winter is long and severe, but the climate is healthful; cattle-raising is the main business. Five small rivers intersect the province. There are minerals in the mountains, but no mines are worked. Quarries of marble and jasper yield some profit. Merino wool has been the principal product; but all industries are repressed by feudal rights and laws of entail and mortmain. Game is plentiful, and fish are abundant. Silk worms are cultivated; oil, olives, chestnuts, and grapes grow naturally. There is very little trade or manufacturing industry.

AVILA Y ZUNIGA, DON LUIZ DE; a Spanish general, diplomatist, and historian, b. at Placencia, in Estramadura, enjoyed the favor and confidence of Charles V., who intrusted him with embassies to the popes Paul IV. and Pius IV., and made him grand master of the order of Alcantara. He accompanied the emperor on his expeditions to Africa and against the princes of the league of Schmalkald, and wrote an account of the war which goes under that name, partial, indeed, but able and spirited. The *Commentarios de la Guerra de Alemanna hecha por Carlos V. en* 1546 *y* 1547, have been published repeatedly (first Ven. 1548), and translated into several languages.—AVILA, GIL GONZALEZ DE, b. at Avila, in Old Castile, in 1559, and d. in 1658, was a Jesuit and canon of Salamanca; also royal historiographer for Castile and the Indies. He composed a great number of historical works, of which the following may be mentioned as containing many valuable facts: *Historia de la Vida y Hechos del Rey Don Henrique III. de Castilla* (Madr. 1638); *Historia de la Vida y Hechos del Monarca D. Filipe III.* (in Mendoza's *Monarquia de España*, 3 vols. Madr. 1770); *Historia de Salamanca* (Salam. 1606); and the *Teatro Ecclesiastico de la primitiva Iglesia de las Indias Occidentales* (2. vols. Madr. 1649-1656).

AVILE'S (Anc. *Flavignavia*), a t. of Asturias, Spain, in the province of Oviedo, and 19 m. n. by w. from Oviedo, at the mouth of the chief branch of the Aviles, which is here crossed by a bridge, and is navigable at high water for vessels of the largest size up to the town. It has several good squares, but the streets are irregular and arcaded. There are copper-mines in the vicinity, and a considerable trade is carried on in copper vessels manufactured from their produce, as well as in coal, which is obtained not far from the town. Manufactures of earthenware, glass, linen, etc., are also carried on. A. is one of the cradles of the Spanish monarchy, and contains a number of curious old buildings. The charter granted to the t. by Alonso VII. in 1135 is preserved among the public records. Pop. 7400.

AVITUS, ALCIMUS ECDICIUS, d. 525; a poet and bishop of Vienna, who was canonized as a saint because of his opposition to Arianism. He left a poem on the creation

and original sin, which has been thought to have some resemblance to Milton's *Paradise Lost.*

AV'IZ, an order of knighthood in Portugal, instituted by Sancho, the first king of Portugal, in imitation of the order of Calatrava, and having, like it, for its object the subjection of the Moors. By the present usage, the king of Portugal, who is grandmaster of all of them, wears decorations of the first three orders of Portugal—those of Christ, St. James, and Aviz united in one medal, divided into three equal spaces.

AVLO'NA, or VALONA; a seaport in Albania, the ancient *Audon,* in the pachalik of Janina, on the gulf of A.; pop. 6000. Trade is in the hands of the Christian portion of the people. The Turks manufacture arms and woolen goods.

AVO'CA or OVOCA (Celt. meeting of the waters), a small river in the s.e. of Wicklow co., formed by the union of two streams, rising in the hills of the center of the county. The A. runs through a very picturesque vale only a quarter of a mile broad, with wooded banks 300 to 500 ft. high, and after a course of 9 m., reaches the sea at Arklow. A. vale is celebrated in Moore's *Irish Melodies.*

AVOCA'DO PEAR, or ALLIGATOR PEAR (*Persèa gratissima*), a fruit tree of the natural order *Lauraceæ* (q.v.), a native of the warm regions of America. It attains the height of 30 to 70 ft., and is a slender tree with a dome-like top. The leaves resemble those of the laurel. The flowers small, and are produced towards the extremities of the branches. The fruit is a drupe, but in size and shape resembles a large pear; is usually of a brown color, and has a soft green or yellowish pulp, not very sweet, but of a delicate flavor, which dissolves like butter on the tongue, and is believed to consist principally of a fixed oil. It is called *vegetable butter* in some of the French colonies. It is much esteemed in the West Indies, and often eaten with sugar and lime-juice or wine, or with spices.

AVOCET', or AVOSET (*Recurvirostra*), a genus of birds, which, although having the feet webbed nearly to the end of the toes, is usually ranked among the *Grallæ* or *Grallatores,* upon account of the length of the legs, the half-naked thighs, the long, slender, elastic bill, and the general agreement in habits with snipes. They are distinguished from all other birds, except a few species of humming-bird, by the strong upward curvature of the bill, which is much like a thin piece of elastic whalebone, and most probably a delicate organ of touch, adapted for seeking food in mud, as their webbed feet are for walking upon it, and their long legs for wading in the fens and marshes which they frequent. They are birds of powerful wing. They are not much addicted to swimming. They scoop through the mud with the bill, first to one side, and then to the other, in quest of worms and other small animals; although Audubon has also observed the American A. taking insects which were swimming on the surface of the water, and expertly catching them in the air, running after them with partially expanded wings.—The common A. (*R. avocetta*), the body of which is about as large as that of a lapwing, is sometimes, though very rarely, found in the fenny districts of England; it is also a native of the continents of Europe, Asia, and Africa, occurring even at the cape of Good Hope.—Other species are natives of North America, India, and New Holland.—The American A. (*R. Americana*) has the bill less recurved than the common A.

AVOGADRO'S LAW. See ATOMIC THEORY.

AVOIDANCE, in English ecclesiastical law, the term by which the vacancy of a benefice, or the fact of its being *void* of an incumbent, is signified. A. is opposed to *plenarty,* or fullness. See BENEFICE.

AVOIRDUPOIS, or AVERDUPOIS', is the name given to the system of weights and measures applied in Great Britain and Ireland to all goods except the precious metals and precious stones. The word is generally said to be derived from the French *avoir du pois,* to have weight; but the middle-age Latin word *averia* or *avera,* used for goods in general, or the middle-age Latin *averare,* and French *avérer,* meaning to *verify,* seem to offer more probable etymologies.

The grain is the foundation of the Avoirdupois system, as well as of the Troy. A cubic inch of water weighs 252·458 grains. Of the grains so determined, 7000 make a pound A., and 5760 a pound Troy. See WEIGHTS AND MEASURES.—The A. pound is divided into 16 ounces, and the ounce into 16 drams. A dram, therefore, contains $27\frac{11}{32}$ grains, and an ounce $437\frac{1}{2}$ grains.

TABLE OF AVOIRDUPOIS WEIGHT.

$27\frac{11}{32}$ grains	are	1 dram,	1 dr.
16 drams or drachms	"	1 ounce,	1 oz.
16 ounces	"	1 pound,	1 lb.
28 pounds	"	1 quarter,	1 qr.
4 quarters	"	1 hundredweight,	1 cwt.
20 hundredweight	"	1 ton,	1 ton.

A cubic ft. of water weighs 997·14 oz. A., or nearly 1000 oz., which gives an easy rule for determining the weight of a cubic ft. of any substance from its specific gravity. A. is the weight used in the United States of North America, where, however, in many places, the cwt. contains only 100 lbs., and the ton, 2000 lbs.

AVO'LA, a t. in Sicily, 13 m. s.w. of Syracuse; pop. 11,912. A. was ruined by an earthquake in 1693, but was soon rebuilt. It has a fishery and a sugar refinery; and the neighborhood is still famous for honey, the "honey of Hybla" so much praised by ancient writers.

A'VON, a word of British or Celtic origin, meaning "river" or "stream;" which seems allied to Aa (q.v.), the name of so many continental rivers. It is the name of several of the smaller British rivers. Of these may be noticed: 1. The Upper or Warwickshire A., which rises in northwest Northamptonshire, runs s.w. through Warwickshire and Worcestershire, passing Rugby, Warwick, Stratford, and Evesham, and joining the Severn at Tewkesbury. It has a course of 100 m., and receives several tributaries. 2. The lower, or Bristol, or west A., which rises in northwest Wiltshire, and runs 70 or 80 m. first s. in Wiltshire, and then w. and n.w. between Gloucestershire and Somersetshire. It traverses an oolitic basin, passing Bradford, Bath and Bristol, and empties itself into the British channel. It is navigable for large vessels up to Bristol. It runs generally between deep banks in a rich valley. A canal through the middle of Wiltshire connects it with the Thames. 3. The Wiltshire and Hampshire, or east A., which rises in the middle of Wiltshire, and runs s. 70 m. through Wiltshire and Hampshire, passing Amesbury, Salisbury, and Ringwood, and entering the English channel at Christ church. It is navigable up to Salisbury. It abounds in the small delicate loach. In Wales two rivers named A.—one rising in Monmouthshire, the other in Glamorganshire—fall into Swansea Bay. In Scotland there are several of the same name, affluents of the Spey, Annan, Clyde, and Forth.

A'VON SPRINGS, a resort for invalids, its mineral waters being valuable in cutaneous diseases and rheumatism. Avon is a village in New York, 19 m. s.s.w. of Rochester, beautifully situated on a small plateau near the Genesee river.

AVOYELLES, a parish in Louisiana, on the Red river; 800 sq.m.; pop. '70, 12,926—6175 colored. It is chiefly level and low, and subject to overflows from the river. Corn, rice, cotton, and sugar are the leading products. Chief town, Marksville.

AVRANCHES (anc. *Abrancæ*), a city of the dep. of Manche, France, near the left bank of the Seez, 33 m. s.s.w. from St. Lo. It stands on the sides and summit of a high hill, which extends in a long ridge, and the ascent of which is by zigzag roads on terraces. This hill commands a very wide and beautiful view of a finely wooded and cultivated district, with a winding river, which expands into a broad estuary, at the mouth of which is the high islet peak of Mt. St. Michel. A. was formerly a bishop's see, and its cathedral was one of the most magnificent in Normandy, but was pulled down in 1799 to prevent it from falling. A stone still preserved on the site of the cathedral is said to be that on which Henry II. of England kneeled before the papal legates to receive absolution for the murder of Becket. Before the Roman conquest of Gaul, A. was the capital of the Abrincatui. It was a place of importance during the Roman period. Charlemagne fortified it, but it was taken by the Normans in 865. It was afterwards a frequent object and scene of strife during the wars between the French and English. It has manufactures of lace, tiles, and bricks, and a little trade in grain, butter, cattle, etc. Pop. '76, 7754.

AWÁJI, an island in the inland sea of Japan, between Shikoku and the mainland, celebrated for its crackle and yellow glazed pottery. In Japanese mythology, it was the first created of all the islands.

AWARD, the decision of arbitrators or referees, or the document containing their judgment. An A. must be consonant with and follow the submission, and affec only the parties; it must be final, certain, specific, without palpable or apparent mistake, and must be possible to be performed. The effect of an A. is a final judgment between the parties in all matters submitted. It transfers property as much as does the verdict of a jury, and will estop the statute of limitations. An A. may be enforced by an action at law or under a rule of court. Courts have no power to alter or amend an A., but may recommit to the referee in cases of uncertainty, mistake, etc.

AWÁTA, a village in the suburbs of Kioto, Japan, famous for its yellow faience. A. pottery was invented in the 17th c., is decorated, and by the Japanese is called Tamago Yaki (egg-ware). It is largely exported to the United States.

AWE, LOCH, a lake in the center of Argyleshire, extending in a direction n.e. and s.w. about 24 m., with an average breadth of from half a m. to 2½ miles. It rarely freezes, and its surface is 108 ft. above the sea. The country around consists of mica slate. The scenery is most striking at the n.e. end of the lake, where the water is studded with numerous wooded islets, overshadowed by towering and rugged mountains, prominent among which rises the dark and rocky ridge of Ben Cruachan, 3669 ft. high and 14 m. in circuit. Of the islands, the most noted is Fraocheilean, containing the remains of a castle granted to Gilbert M'Naughton in 1267 by Alexander III. On a peninsula, in the n. end of the lake, stands Kilchurn casle (Caesteal Chaoil-chuirn), once a fortress of great strength, built about 1440 by Sir Colin Campbell of Glenorchy, and garrisoned, as late as 1745, by the king's troops. The waters of the lake are carried off at its n.w. end by the river Awe, which, after a course of 7 m., enters the sea at Bunawe on loch Etive. The magnificent "Pass of Awe," through which the road runs beneath the shoulder

of Ben Cruachan, was the scene of a conflict, in 1308, between Robert the Bruce and the M'Dougalls of Lorn, in which that clan was all but exterminated. At the n.e. end of the loch, it receives the waters of the Orchy and Strae, flowing through glens of their own names. Loch A. contains fine fish, especially trout, *salmo ferox*, and salmon; and the small villages of Claddich and Port Sonachan, on the e. side of the loch, due n. of Inveraray, are the general resort of anglers.

A-WEATHER is a term denoting the position of the helm when jammed close to the weather-side of a ship; it is the reverse of *a-lee*.

A-WEIGH, as applied to the position of an anchor, when just loosened from the ground and hanging vertically in the water, is nearly equivalent to *a-trip*.

AWN (*Arista*), in the flowers of grasses, a solitary pointed bristle, growing either from a glume or a palea. The flowers of some grasses are entirely *awnless;* in many, the glumes alone are *awned* (or *aristate*), or only one of them; in others, the glumes are awnless, and the paleæ, or one palea, awned. The awn is often terminal, and appears as a prolongation of the midrib of the glume or palea; from which, however, it sometimes separates below the point, and is then said to be on the back of it, or *dorsal;* sometimes it is jointed at the base, and finally separates at the joint, sometimes it is knee-bent or geniculate; sometimes it is twisted, and liable to twist and untwist hygrometrically; sometimes it is rough, or even serrate, at the edges, as in barley; sometimes it is feathery, as in feather-grass (*stipa*), which also is remarkable for the great length of its awn. The characters of genera and species are often derived from it, but it is not always invariable, even in the same species, and the cultivated varieties of wheat and oats differ much in being more or less *bearded*. There appears to be a tendency to the diminution or disappearance of the awn through cultivation.

AWYAW, AGA-OJO, or OYO, a city in central Africa, the capital of Yoruba; est. pop. 70,000.

AX, or DAX (anc. *Aquæ Augustæ*), a noted watering place in France, at the foot of the Pyrenees, 2000 ft. above the sea, on the Odour river, 32 m. by rail n.e. of Bayonne. It is a village of about 2000 inhabitants. There are more than 50 springs varying in temperature from 100° to 200°. One of the springs is famous for curing leprosy.

AXAYCA'TL, Emperor of Mexico, the father of the second Montezuma. About 1467 he led his Aztecs to the conquest of Tehuantepec, and afterwards defeated a rebellion that threatened his capital, the city of Mexico. He died suddenly, about 1477. Half a century later the soldiers of Cortes occupied A.'s palace, and discovered an immense treasure of gold and silver in ore and bars, with jewels, and many curious articles of manufacture.

AXE, the name of two small rivers in the s.w. of England. One rises in the Mendip hills, n. of Somerset, runs first s.w. and then n.e., through a carboniferous limestone, trias, and diluvial basin, past Wells and Axbridge, into the Bristol channel. The other rises in west Dorset, and flows 21 m. s. and s.w., through east Devonshire, in an oolitic and trias basin, past Axminster into the English channel. A. is only another form of Exe. See AA.

AXE, one of the oldest tools used by man; formed in the early ages of stone, bronze, copper, and iron. At present an A. is mainly of wrought iron, with a cutting edge of fine steel. The butt or main part, is made of good rolled iron, cut into suitable lengths, hollowed at the middle so that when the ends are brought together the hollow will form the eye for the handle. Between the ends is welded in a cutting piece of steel, projecting an inch or more beyond the iron, and thinned down nearly to an edge. Having been properly tempered and ground, and fitted with a wooden helve, the axe is ready for use. Forms and weights vary according to the use to which the tool is to be put. For very hard timber the cutting edge is narrow, and the whole instrument heavy; for carpenter work on soft timber, the edge is of 8 to 12 in., as in the broad-axe. Common forest axes weigh from 3 to 7 lbs. Besides these forms, there are the adze, a tool used for chipping, or rough planing by carpenters, and the pickaxe (which is not an axe in any sense) for digging in hard ground. American axes have a high reputation in Europe, and have to some extent supplanted the English article in the markets of that country.

AX'EL, or **AB'SALON**, Archbishop of Lund, in Denmark, and also minister and general of king Waldemar I., was b. in 1128, and d. 1201. He was descended of a distinguished family, and, in his youth, studied at Paris. A. distinguished himself as well by wisdom and uprightness in peace, as by valor and address in war. The Wendish pirates were not only driven from the coasts of Denmark, but attacked in their own settlements, and subdued. He defeated the Pomeranian prince, Bogislav, and made him dependent on Denmark. In the wise legislation of Waldemar and of his son, he took a great part. He favored and promoted learning and art, and to his encouragement we owe the first connected history of Denmark by Saxo Grammaticus. By building a fortified castle for defense against the pirates, he laid the foundation of the future great city of Copenhagen, which was then an insignificant village, inhabited only by fishermen. Owing to this origin, Copenhagen has sometimes got the name of Axelstadt. A. lies buried in the

church of Soroe, where he had founded a monastery. The relics found when his grave was opened in 1827, the chief of which were a bishop's staff and ring, are described in the latest complete biography of A. by Estrup, translated into German by Mohnike in Illgen's *Zeitschrift für Historische Theologie* (2 vols. Leip. 1832).

AXESTONE, a mineral generally regarded as a variety of nephrite (q.v.). It is of a greenish color, is more or less translucent, hard, tough, and not easily broken. It occurs in primitive rocks, always massive, and is found in Saxony, in Greenland, and in New Zealand and other islands of the southern Pacific. It derives its name from the use to which it is put by the natives of these islands for making their hatchets. They also make ear-drops of it.

AX'HOLME ISLE (A. Sax. *holme*, a river-isle), a low level tract in the n. of Nottinghamshire, surrounded by rivers—the Trent on the e.; Don, n. and w.; Torne and Idle, on the w.; and Vicardyke, between the Trent and Idle on the south. This district, 18 m, from n. to s., and five on an average e. and w., was anciently a forest, but afterwards became a marsh. The marsh was drained into the Trent in 1634 by Vermuyden, a Dutchman, after five years' labor, and at the cost of £56,000. The reclaimed land became very fertile under Dutch and French Protestant settlers, and after much litigation, it was, in 1691, divided, the original inhabitants receiving 10,532 acres, and the settlers 2868. On the land are raised abundant crops of wheat, oats, rye, pease, beans, clover, flax, rape, hemp, potatoes, and onions. Peat and turf fuel abound, and valuable gypsum beds occur. The water is brackish, too hard for washing, and curdles milk when boiled with it. A. I. includes seven parishes. There are two small towns, Crowle and Epworth.

AX'IL, *Axilla*, in botany, the angle between the upper side of a leaf and the stem or branch from which it grows. Buds usually grow in the axils of leaves, although they are not always actually developed; but a bud may be made to appear in such a situation, and to form a new shoot or branch, by artificial means, which direct the strength of the plant more particularly to that quarter, as cutting over the main stem, wounding it above the place where the new branch is desired, etc. Flowers or flower-stalks (*peduncles*) growing from the axils of leaves are called *axillary*.

AXIM', a t. on the Guinea coast, Africa, 73 m. w. of Cape Coast Castle. In 1642, it was taken from the Portuguese by the Dutch, who, in 1872, ceded it with the whole of their possessions in Guinea to the English.

AX'INITE, a mineral containing oxide of iron, lime, alumina, and silica, occurring in flat, sharp crystals, edged like an axe.

AXINOMANCY (Gr. *axine*, an axe, and *manteia*, divination), a mode of divination much practiced by the ancient Greeks, particularly with the view of discovering the perpetrators of great crimes. An axe was poised upon a stake, and was supposed to move so as to indicate the guilty person; or the names of suspected persons being pronounced, the motion of the axe at a particular name was accepted as a sign of guilt. Another method of A. was by watching the movements of an agate placed upon a red-hot axe. This is only one of a multitude of analogous modes of divination practiced in all ages and among all nations. See DIVINATION, and DIVINING-ROD.

AXIOM, a Greek word meaning a *demand* or *assumption*, is commonly used to signify a general proposition, which the understanding recognizes as true, as soon as the import of the words conveying it is apprehended. Such a proposition is therefore known directly, and does not need to be deduced from any other. Of this kind, for example, are all propositions whose predicate is a property essential to our notion of the subject. Every rational science requires such fundamental propositions, from which all the truths composing it are derived; the whole of geometry, for instance, rests on, comparatively, a very few axioms. Whether there is, for the whole of human knowledge, any single, absolutely first A., from which all else that is known may be deduced, is a question that has given rise to much disputation; but the fact, that human knowledge may have various starting-points, answers it in the negative. Mathematicians use the word A. to denote those propositions which they must assume as known from some other source than deductive reasoning, and employ in proving all the other truths of the science. The rigor of method requires that no more be assumed than are absolutely necessary. Every self-evident proposition, therefore, is not an A. in this sense, though, of course, it is desirable that every A. be self-evident; thus, Euclid rests the whole of geometry on 15 assumptions, but he proves propositions that are at least as self-evident as some that he takes for granted. That "any two sides of a triangle are greater than the third," is as self-evident as that "all right angles are equal to one another," and much more so than his assumption about parallels, which, it has been remarked, is neither self-evident nor even easily made evident. See PARALLELS. Euclid's assumptions are divided into 3 "postulates" or demands, and 12 "common notions"—the term A. is of later introduction. The distinction between axioms and postulates is usually stated in this way: an A. is "a theorem granted without demonstration;" a postulate is "a problem granted without construction"—as, to draw a straight line between two given points.

AXIS, in geometry.—The A. of a curved line is formed by a right line dividing the curve into two symmetrical parts, so that the part on one side exactly corresponds with that on the other; as in the parabola, the ellipse, and the hyperbola. The A. of any geometrical solid is the right line which passes through the center of all the corresponding parallel sections of it; in this sense, we speak of the A. of a cylinder, a globe, or a spheroid. By the A. of rotation, we understand the right line around which a body revolves.—In physical science, the A. of a *lens* is the right line passing through it in such a manner as to be perpendicular to both sides of it; and the A. of a telescope is a right line which passes through the centers of all the glasses in the tube. The A. of the *eye* is the right line passing through the centres of the pupil and the crystalline lens.

AXIS, in botany, a term applied to the central part both above and below ground, around which the whole plant is regarded as arranged. The stem is called the *ascending A.;* the root, the *descending axis.* The opposite tendencies of growth appear as soon as a seed begins to germinate, in the radicle and plumule; the former of which is the descending A., and the latter the ascending A.; the former descending deeper into the soil, the latter ascending towards the air and light. That part of the stem around which the flowers are arranged is called the *floral A.*, and, in describing some kinds of inflorescence, the terms *primary floral A.*, *secondary floral A.*, etc., are occasionally employed.

AXIS, *Cervus axis*, a species of deer, abundant on the banks of the Ganges, but found throughout India and in many islands of the eastern Archipelago. It was known to the ancients by the name axis. One of its Indian names is chittra, and by British sportsmen in India it is generally called the spotted hog-deer. By some naturalists, it has been made the type of a genus of *cervidæ*, called *axis.* The A. has a great resemblance in size and coloring to the European fallow-deer; it is generally of a rich fawn color, beautifully spotted with white, nearly black along the back, the under parts snow-white. The horns, however, differ very much from those of the fallow-deer, being slender, sharp-pointed, little branched, and not at all palmated. The female has no horns. The A. frequents thick jungles in the vicinity of water, and feeds during the night. It is commonly found in herds of 15 or 20, of which 3 or 4 are males. Its sense of smell is remarkably acute, and it is generally very shy and timid, so that sportsmen find it difficult to get within shot. The males, however, sometimes exhibit great courage in defense of the young. It is very easily domesticated, is very gentle in its manners, has been frequently imported into Europe, and breeds freely in the parks in which it is kept at a few noblemen's and gentlemen's seats in Britain and France.

AXLE, the bar of metal or wood, connecting the wheels and supporting the body of a wheeled vehicle. In railway carriages the A. is fastened to and revolves with the wheels.

AX'MINSTER, a small t. in e. Devonshire, on the side of a little hill on the left bank of the Axe. Pop. in '71, 2861. A. was once famous for the manufacture of Turkey and Persian carpets, which were little inferior to those imported. Two celebrated geologists have been connected with A.: Dr. Buckland was born here, and Dr. Conybeare was lord of the manor, and vicar.

AX'MOUTH, a village at the mouth of the Axe, e. Devonshire. A mile e. of A. occurred, in 1839, a landslip; an area of 200 ft. wide, for three quarters of a mile parallel to the shore, having sunk 250 ft. below the sea, with a great noise. The chasm thus formed became a lagoon, while the neighboring sea-bed rose 40 feet. Rather more than a mile further e., occurred another but smaller landslip in 1840. The district around consists of greensand strata.

AXOLOTL, pronounced *acho'latl* (*gyrinus*, or *axolotes edulis*), a remarkable animal, found in great abundance in some of the Mexican lakes, and particularly in the lake of Mexico itself. It is a batrachian (q.v.) reptile of the family of the *proteidæ* or *perennibranchiate batrachians*, in which the gills remain during life, and the lungs are never sufficiently developed to maintain respiration by themselves. It is in general form very like a fish; has a large and broad head; and tapers into a long compressed tail, which has a thin membranous fin both on its upper and its lower side. It has four legs, with toes not webbed; and on each side of the neck the gills form three long branched or feathered processes, which give it a very remarkable appearance. It is brown, and mottled with small black spots. When full grown, it averages 8 or 9 in. in length, though sometimes measuring 16 inches. It is esteemed a great delicacy in Mexico, and is there constantly brought to the market.

AXUM, once the capital of the Ethiopian kingdom of the same name, is situated in the modern Abyssinian province of Tigré, of which it is capital. Lat. 40° 7′ n.; long. 39° 27′ e. It now lies mainly in ruins, among which stands the principal church of Abyssinia, built in 1657. Pop. 2000. The former greatness of the city is testified by yet remaining structures cut in granite, some of which have inscriptions. From these it appears that the Axumite empire extended over Abyssinia, and even over Yemen and Saba in Arabia, and possessed the command of the Red sea. It acquired political importance from the circumstance, that it formed on the s. a boundary to the world-embracing power of Rome, as well as to that of Parthia, which then extended as far as Arabia. The Byzantine emperors even paid an annual tribute to the sovereigns of Axum. This

country was also the furthest point southward that Grecian civilization reached; through the medium of Egypt, Greek philosophy spread into A., and the Greek language became the language of the court and of the priests. Under king Aizanes, who, in a still remaining inscription, appears as a heathen, Christianity was introduced into the country from Egypt by the two apostles Frumentius and Ædesius, who were followed by many priests from the same quarter. The new doctrine soon spread over the whole country; Frumentius was made the first bishop of A., and Fremona was built in honor of him. The stone churches, many of them very imposing, yet scattered over the whole of Abyssinia, owe their architecture to Egyptian priests, and arose at that period, as well as the most celebrated Abyssinian convents and hermitages. The Axumite empire carried on, through Adule, an active commerce with Arabia and India; it formed the outermost bulwark of Christianity; and, as such, particularly from about the 6th c., it interfered in behalf of the Christians in Arabia, and became the natural enemy of Mohammedanism. The contests in which it soon became involved with that power caused its fall, as the kings gradually lost their possessions in Arabia, and the whole coast on the Red sea and gulf of Aden. The outlets for commerce were thus cut off, and the empire was at the same time so weakened by constant wars, that internal disorders brought on its complete dissolution.

AYACU'CHO, a department of s. Peru, on the e. side of the Andes, 24,213 sq.m.; pop. 147,909. It has a rough surface and variable climate; little is done in mining; cattle and honey-raising and agriculture are the principal employments. The battle of Dec. 9, 1824, fought in this department, secured the independence of the Spanish-South American colonies. The Spaniards, in largely superior force under Laserna, were effectively beaten and their leader captured by the colonists under gen. Sucre, the result being the capitulation of the Spaniards in Peru and the surrender of all their posts.

AYACU'CHO, a t. in a department of the same name in s. Peru. Here, on the 9th Dec., 1824, the combined forces of Peru and Colombia—the latter then comprising Ecuador, New Granada, and Venezuela—totally defeated the last Spanish army that was ever seen on the new continent.

AYA'LA, Pero Lopez de, called El Viejo, to distinguish him from his son of the same name, was b. at Murcia in 1332, of one of the first families of the Castilian nobility. He stood high in the regard of several kings of Castile, and filled the first offices of the state, latterly, that of high-chancellor and high-chamberlain of Castile. At the battle of Najera, in 1367, he was taken prisoner by the English, then in league with Peter the cruel, and confined for some time in an English dungeon; and again in 1385, by the Portuguese, at the battle of Aljubarota. He d. at Calahorra, in 1407. A. has acquired a name, not only as a statesman, but as a writer, especially as a historian and poet. His best known work is his *Crónicas de los Reyes de Castilla D. Pedro, D. Enrique II., D. Juan I., D. Enrique III.* (2 vols. Madr. 1779–80—the older editions of 1495 and 1591 are imperfect). He was the first among the Spaniards to give up the usual simple narrative of events in the order of time, and to seek to give a more rational representation of them according to the rules of historic art. It is only in recent times that the poetical works of A. have been discovered, the most remarkable of which is the *Libro o' Rimado de Palacio.* This "Book in Rhyme on Court-life," as its singular title may be translated, was begun during the poet's first captivity in England, and is composed in the old national form of rhyming Alexandrine stanzas of four lines; the contents are satirical and didactic. A. appears also in his poetical works as a representative of that transition epoch of Spanish national literature, when it was passing from a popular original literature to one of a more artificial imitative character.

AYAMON'TÉ, a t. of Andalusia, Spain, on the left bank of the Guadiana, and near its mouth, where it forms the boundary between Spain and Portugal. It stands on an acclivity. The upper part of the town consists of narrow and irregular streets; those of the lower part are regular and wide. There are three public squares. The principal occupation of the inhabitants is fishing. Boat-building and lace-making were once very extensively carried on, but both have greatly declined. Pop. 8000.

AYE-AYE, *Cheiromys Madagascariensis,* a quadruped about the size of a hare, a native of Madagascar, which was at first placed by naturalists among squirrels, and was ranked by Cuvier along with them in the order of rodents (*rodentia*), although Sonnerat, who discovered it, pointed out its affinity also to the makis or lemurs, to which family it is now pretty generally referred. The principal reason for placing the A. among the *Rodents,* has been found in the conformation of its teeth; but the other characters of the animal agree generally with those of the lemurs, and its habits resemble theirs. The A. has large, broad ears, large round eyes, long brownish gray hair, and a large bushy tail, which it does not carry over its back as squirrels do. It is very active during the night, but sleeps during the day. In confinement, it will subsist on boiled rice and fruits. It seems to be able to make as good use of its front teeth for gnawing as any of the rodents (gnawers). Mr. Ellis mentions one which ate its way through a barrel, and made its escape. He thinks it probable that there are more species than one.

AYESHAH, the favorite wife of Mohammed, was b. at Medina in 610 or 611 A.D. She was only nine years of age when she married the prophet. Her father's name was

Abdullah, but he was surnamed Abu-Bekr, "father of the virgin," in consequence, it is said, of his daughter being the only one of Mohammed's wives who was a virgin. Although A. bore no children to Mohammed, she was so tenderly beloved by him, that he was wont to say that she would be the first of his wives to whom the gates of Paradise would be opened. It is stated by Mohammedan historians, that to the charms of her beauty she added a knowledge of mathematics, rhetoric, and music. But this statement is improbable. She was accused of adultery, but Mohammed having produced a revelation from heaven to the effect that she was innocent, punished her accusers, and made it an article of faith for all time, that whoever should not believe in her purity should endure the pains of hell forever. In his last illness, Mohammed, by his request, was carried to her house, and expired in her arms. After the prophet's death, A. took an active part in the plot which deprived kalif Othman of his power and life, and headed a force to resist the accession of Ali. After some partial success, however, the troops under her were effectually defeated by Ali, and she was taken prisoner. Ali spared her life, and allowed her to reside in any town in Arabia she chose, provided she did not interfere with state affairs. She d. at Medina (677 A.D.). In spite of her political adversities, A. was highly venerated by all true Mussulmans, and named the *prophetess*, and the *mother of believers*. She was consulted on divers points of the Koran, and her interpretations were held to be binding. They have been collected in the *Sunna* (q.v.).

AYLES'BURY, a t. in the center of Buckinghamshire, on a rivulet which flows into the Thame, an east branch of the Thames. The pop. of the electoral district in 1871 was 28,760; that of the town proper about 6000. A., with its hundreds, returns two members to parliament. It is chiefly an agricultural town. Many fat ducks are reared in the neighborhood to supply the London markets at an early period of the season, when they fetch very high prices. A. is a very ancient town, having been taken from the Britons by the Saxons in 571.

AYLES'FORD, a village near the center of Kent, on the right bank of the Medway, 3½ m. n.e. of Maidstone. Remarkable ancient remains occur here. On a hill-slope 1½ m. to the n.e., there still stands a celebrated ancient dolmen, or burying-place, called Kits Coity House—a small truncated pyramidal chamber, open in front, and formed of four large rude Kentish rag blocks, three of which are uprights, with a slight slope inwards, and the fourth laid on them. Of the side-stones, one is 7 by 7½ ft., 2 ft. thick, and 8½ tons in weight; the second is 8 by 8½ ft., weighing 8 tons; and the third is smaller and more irregular in form. The capstone is 12 by 9½ ft., 2½ ft. thick, and weighs 10½ tons. This dolmen seems to have been the center of a group of ancient monuments connected by a long stone avenue with another group, 7 m. to the s.e. In this district also occur, on the brow of the chalk-hills on both sides of the Medway, large circular sepulchral pits, opening at bottom into one or more chambers. Some of these pits are covered with flat stones, and filled with flints. At A. the Britons defeated the Saxons in 455, and drove them from the island; but early in the 7th c. the Saxons were victorious here.

AYLMER, a village in Ottawa co., province of Quebec, Canada, on lake Deschênes, at the foot of steam navigation for the upper Ottawa. Pop. about 1700.

AYLMER, a lake about 50 by 30 m., in British America, 80 m. n. of Great Slave lake.

AYLMER, or ELMER, JOHN, 1521–94; an English theologian, a graduate of Oxford and tutor to lady Jane Grey. Mary's accession compelled him to abandon the country, and he went to Switzerland, where he wrote a reply to John Knox's argument against female sovereigns, in which A. highly flattered Elizabeth. He returned after E.'s accession, and was made archdeacon of Lincoln, and one of the synod that settled the doctrines and discipline of the church. As bishop of London, 1576, he went so far in retaliating for Roman Catholic intolerance as to be rebuked by the privy council.

AYLOFFE, Sir JOSEPH, an English antiquary of celebrity, b. about 1708 in the parish of Framfield, Sussex. In 1731 he was elected a fellow of the royal society, and in the following year, a fellow of the society of antiquaries. He was one of the first council of this society, after it received its charter of incorporation in 1751; and he was made vice-president some years after. When the new state-paper office was established in 1763, he was made one of the commissioners for the preservation of the state papers. In 1772, he published a valuable work on the national records. He also wrote several useful papers for the publications of the society of antiquaries; and projected, and was engaged in the execution of the work, afterwards continued by Gough, and known as Gough's *Sepulchral Monuments*, at the time of his death in 1781.

AYMAR, JAQUES, a celebrated French professor of the art of divination. A. was the son of a peasant of Dauphiné, and was b. at St. Veran in Sept., 1662. He was brought up as a mason, but he forsook that trade for the divining-rod, which he used at first to point out springs, hidden treasures, etc. In 1692, a murder and robbery was committed at Lyon, and A. and his rod were called into requisition to detect the criminals. In some way or other, he succeeded in discovering one of the guilty parties. A.'s fame having been spread by this incident, he was called to Paris to exhibit his art before the prince de Condé; but, unfortunately for his reputation, his power of divina-

tion utterly failed him; and being forced to confess himself an impostor, he was sent back in disgrace to his original obscurity.

AYMARAS, the name of an aboriginal people of South America, now chiefly in Bolivia, numbering about 200,000. They claim a very ancient origin from a people who came from the north and made the head of their government on the sacred island in lake Titicaca, and they also claim that they furnished the Quichian or Inca people with their religious ceremonies and knowledge of arts. It appears that the A. tilled the earth, built large and even splendid edifices, were familiar with painting and sculpture, and probably knew something of astronomy. They venerated the dead, putting them in a sitting position in large stone tombs that would hold a dozen, ranged so as to face each other, their feet meeting in the center of a circle. Some tombs were of brick; some of several stories with a body in each story; and all had openings facing the east, as the A. were sun worshipers. The present sun they called the fifth of a series, all of which had risen from the sacred lake. The Peruvian Incas gradually subdued the A. and took possession of their country. The existing A. are Roman Catholics. They are of ordinary Indian complexion, but of intelligent though melancholy expression. Agriculture is their chief reliance.

AYMON, the surname of four brothers, called respectively Alard, Richard, Guiscard, and Renaud, sons of Aymon or Haimon, count of Dordogne, who figure among the most illustrious heroes of the chivalric poetry of the middle ages; but their historic existence must be considered problematical, as the deeds attributed to them possess in so large a measure a miraculous character. What basis of fact may underlie the fanciful accretions of mythology, it is now impossible to determine. Their career belongs to the cycle of marvels, of which Charlemagne is the central point, and their adventures furnished rich material to the romantic narratives of Italy in the 15th and 16th c., and, in fact, were the exclusive subject of some of these. A novel, entitled *Les Quatre Fils Aymon*, by Huon de Villeneuve, a French poet of the age of Philippe Auguste, details very minutely their exploits. Finally, Ariosto conferred a poetical immortality on the family by the publication of his *Roland*, in which Renaud, the bravest of the four brothers, plays continually the most distinguished part. The traditions concerning them are not uniform or consistent. Some have a Provençal origin; but the author or authors of the popular German book which Tieck has edited and published, entitled *The Beautiful and Entertaining History of the Four Brothers Aymon, and of their Horse Bayard, with the Deeds and Heroic Feats that they Accomplished against the Pagans, in the Time of Charlemagne*, seem to have drawn from a different source. The most probable hypothesis, therefore, is, that the varieties in these poetic legends are due to the fancy and national predilections of the particular authors, and that there originally existed a single tradition, out of which the whole sprang.

AYO'RA, a t. of Spain, in the province of Valencia, and 50 m. s.w. from Valencia, on the upper part of a river of the same name, and situated in an extensive hollow at the base of a limestone mountain. It has four squares and wide streets. On the summit of the hill are the remains of an old castle, close to which the town once stood. The inhabitants are chiefly employed in husbandry and oil-making. Pop. 5412.

AYR, the co. t. of Ayrshire, is situated on the left bank of the river Ayr, about the middle of the coast of Ayrshire, 40 m. s.s.w. of Glasgow by rail. It lies in a coal district. A. is a clean and handsome town, and its principal streets are well built. To the south, between the town and the race-course, numerous elegant villas have recently sprung up. The spire of the assembly-rooms is 217 ft., and the Wallace tower, 113 ft. high. Three bridges span the river and connect the town with Newton-upon-Ayr—the "auld brig" and the "new brig" (taken down in 1877, and rebuilt) of Burns, together with a railway bridge. Part of the tower of the old church of St. John, built in the 12th c., and turned into a fort by Cromwell, is still standing. A. harbor is formed by the estuary of the river, and is protected by piers and a breakwater. A large wet dock has recently been built. The coasting trade is considerable. The chief export is coal, 180,000 to 200,000 tons yearly being exported from the Ayr collieries. A considerable quantity of grain and timber is imported. At one time, much wine was imported from France. At an early date, A. was a commercial and military place of some importance. William the lion made it a royal burgh about 1202. During the Scottish wars of independence, it formed a regular center of military operations, and, while in possession of an English garrison, it was the scene (according to *Blind Harry*) of Wallace's first exploits. The principal objects of interest near A. are connected with the memory of Robert Burns. See ALLOWAY KIRK. Pop. in 1871, municipal burgh, 7987; of the parliamentary burgh, including Newton-upon-Ayr, 17,954. A. unites with Campbelton, Irvine, Inverary, and Oban, in sending a member to parliament. Parliamentary constituency (1875–1876), 2426; annual value of real property, £65,150.

AY'RER, JACOB, next to Hans Sachs the most prolific and important German dramatic writer of the 16th century. His history is involved in obscurity; but it is known that he was a citizen of Nürnberg in 1594, and a procurator in the courts of law. It was not till after his death, in 1605, that a collection of his pieces was published, con-

sisting of 66 tragedies, comedies, and carnival plays (Nürnb. 1618). A. has the same garrulous breadth of dialogue as Hans Sachs, but is inferior to him in wit and humor.

AYRES, Romeyn B., b. N. Y., 1825; a graduate of West Point; served in the Mexican and civil wars; for good conduct in the Richmond campaign made brevet maj. gen. of the U. S. army and of volunteers.

AYR'SHIRE, an extensive maritime co. in the s.w. of Scotland, bounded, n., by Renfrewshire; w , by the firth of Clyde and the North channel; s., by Wigton and Kirkcudbright; e. and n.e., by Dumfries and Lanark. Its greatest length is 78 m.; its greatest breadth, 26—average 14½; area, 1149 sq.m., or 735,262 statute acres. It is the seventh in size of the Scottish counties. The general aspect of the county is undulating and hilly, the land attaining no great elevation, except a small portion in the n., and some considerable tracts in the s. and s.e., which are mountainous. None of the eminences exceed 2000 feet. A. contains a great number of lakes and small streams, the latter rising near the inland boundary of the county. The chief rivers—only 20 to 35 m. long—are the Ayr, with its tributary the Lugar, and the Doon, which flow across the center of the county; the Garnock and Irvine in the n.; and the Girvan and Stinchar in the south. A. to the s. of Girvan consists of lower Silurian rocks, and to the n. of that river, of patches of Devonian, carboniferous, and trap rocks. It is rich in valuable minerals, especially coal, ironstone, limestone, and freestone. The other minerals have been long wrought, but it is only of late years that the working of ironstone has been established—and is now carried on on a large scale in the n. of the county. On the banks of the Ayr is found an excellent species of whetstone, called water-of-Ayr stone. The climate of A. is mild and healthy, but moist. The soil along the coast is light and sandy, interspersed with deep loam; the most fertile districts are in the center of the county, where clay predominates. On the e. side are extensive mosses and moorlands. The three ancient divisions of the county are—Carrick, s. of the Doon, mostly wild and hilly; Kyle, between the Doon and the Irvine, containing much rich level land, but towards the coast the soil is light, and, though well cultivated, is less productive; and Cunningham, comprising all the country n. of the Irvine, mostly fertile. The characteristics of these districts are rudely indicated in the old country rhyme:

> Kyle for a man;
> Carrick for a coo;
> Cunningham for butter and cheese;
> And Galloway for woo.

Agriculture in A. till about 1800, was very backward; but since then, especially of late, extraordinary progress has been made in furrow-draining, improved rotation, and road-making; while the condition of the peasants has been much improved. In 1878, 314,191 acres were under crops and grass, held by 3569 persons, the farms being generally small. Dairy-husbandry is carried to high perfection in Ayrshire, the breed of milch cows, of which it rears a greater number than any other Scotch county, being noted as the finest in the kingdom for the quantity and quality of their milk. The Dunlop cheese, so called from the parish of that name, is almost as celebrated as Stilton, but is now almost superseded by that made on the Cheddar process. The breed of horses is also excellent. Manufactures, especially woolen and cotton, are carried on to an important extent. At Catrine there are extensive cotton-works; at Kilmarnock, dye-works, iron-foundries, etc.; and at Cumnock, a large pottery. Of the minor manufactures, the most characteristic is that of ornamental woodwork, often bearing tartan designs, which is extensively carried on at Mauchline. Great iron-works exist at Muirkirk, Hurlford, Kilwinning, Ardeer, Dalry, and Dalmellington. Maybole manutures shoes and agricultural implements. There are valuable fisheries on some parts of the coast. Troon, Ardrossan, Ayr, and Irvine are thriving ports. Pop. '71, 200,809; inhabited houses, 26,798; and the number of children, from five to thirteen, receiving education, 30,576. A. county returns two members to parliament. The chief towns, besides Ayr, are Kilmarnock, Girvan, Maybole, Dalry, Kilwinning, Beith, Irvine, Stewarton, Ardrossan, Saltcoats, Troon, Mauchline, Galston, Newmilns, Kilbirnie, and Largs. Of antiquities, the most interesting are the ruins of Crossraguel Abbey, near Kirkoswald, and of the castles of Turnberry, the family seat of Robert the Bruce, Dunure, Loch Doon, Dean, Auchinleck, Dundonald, etc.; also the ruins of Alloway Kirk.

A. was inhabited, in the time of Agricola, by the Damnii, with whom were afterwards mixed the Scots from the opposite coast of Kintyre. In the 8th c., the Northumbrian Saxons seized the territory; and afterwards came the Normans, whose traces still exist in local names. During the religious persecutions of the Stuarts, A. was a stronghold of the Covenanters.

AYSCUE, Sir George, 1616–76; an English naval commander. He was knighted by Charles I., and in the civil war took the side of the parliament, commanding in the waters around Ireland. In 1651, he reduced Barbadoes and Virginia to subjection, and the next year assisted Blake in the struggle with De Ruyter and Van Tromp. Four years later he had command of a squadron in the "four days" battle, in which the *Royal Prince*, his flag ship, stranded and was surrendered to the Dutch, who kept him a prisoner for many years.

AYTON, Sir ROBERT, a Scottish poet and favorite courtier in the reign of James VI. He was a younger son of Andrew Ayton of Kinaldie, Fifeshire, where he was born in 1570. He was enrolled as a student in St. Leonard's college, St. Andrews, in 1584, and took his degree of M.A. in 1588. For purposes of study, he next visited France, from whence he addressed, in 1603, an elegant panegyric, in Latin verse, to king James, on his accession to the throne of England. This poem appears to have been the making of A.'s fortune, for we find him afterwards appointed, successively, one of the gentlemen of the bedchamber, private secretary to the queen, and master of requests. Subsequently, he held the appointment of secretary to the queen of Charles I. King James employed him to convey copies of one of his works, conjectured to be his *Apology for the Oath of Allegiance*, to the German courts. A. was on terms of familiarity with all the most eminent men of his time—poets, wits, and philosophers alike—among others, Hobbes and Ben Jonson. He was himself a poet of considerable merit; but, unfortunately, a large number of his effusions being complimentary verses to his friends, are characterized by conceit and extravagant flattery. He was one of the first Scotsmen who wrote in English with any degree of elegance and purity. His verses on general topics "are conceived in a refined and tender strain of fancy, that reminds us more of the fairy strains of Herrick than anything else." Burns had a great admiration of some of A.'s pieces, two or three of which he paraphrased. A. is also said to have written verses in Greek and French, as well as in English and Latin. Several of his Latin poems are preserved in the work called *Delicia Poëtarum Scotorum*, printed at Amsterdam in 1637. A. died in Whitehall palace, Mar., 1638.

AYTOUN, WILLIAM EDMONDSTOUNE, was a native of Edinburgh, having been b. there in 1813. He received his education at the metropolitan university, and was called to the Scottish bar in 1840. In 1845, he was appointed regius professor of rhetoric and belles-letters in the university of Edinburgh; and after the formation of the Derby administration, in 1852, he was promoted to the shrievalty of Orkney and Shetland. He married a daughter of prof. Wilson. During many years, prof. Aytoun devoted himself to literary work. The earliest work of his with which we are acquainted is entitled *The Life and Times of Richard I.*, published in 1840—a subject well treated, and singularly in consonance with his chivalrous and romance-loving nature. Despite his minstrel tendencies, he is a master of caricature and parody; and many of the most successful of the *Bon Gaultier Ballads* are understood to be from his pen. In 1849, he published the *Lays of the Scottish Cavaliers and other Poems*, which established his reputation as a poet of the school of Sir Walter Scott, and which has run through many editions. Among his subsequent writings are—*Firmilian, a Spasmodic Tragedy*, published in 1854; and *Bothwell*, a narrative poem of considerable length, in the measure and manner of Sir Walter Scott, which was, after its first publication in 1856, to a large extent recast and improved. His edition of the *Scottish Ballads*, in 2 vols., appeared in 1858. In the ensuing year, he issued, in conjunction with his friend, Mr. Theodore Martin, translations of various minor poems of Goethe, in one volume. He was for many years one of the most frequent and brilliant contributors to *Blackwood's Magazine*. Prof. A. was successful in quite opposite departments of literature—he was distinguished at once as a poet and humorist. His poems exhibit a ballad-like simplicity, and a fiery flow of narration—the special merits of the poetical school in which he graduated; while his tales—the best known and appreciated of which are *The Glenmutchkin Railway*, and *How I became a Yeoman*—possess a certain robust humor and farcical abandonment, and are related to the writings of the great masters of humor much in the degree that the "screaming farce" is related to genteel comedy. His poetical powers appear in their greatest perfection in the *Lays of the Scottish Cavaliers;* the special merits of his humor are best exhibited in *How I became a Yeoman*. As a critic, he took up the knout of the dreaded Christopher North of the *Noctes*, which he wielded with considerable dexterity and force. Prof. A. died at Edinburgh, Aug. 4, 1865. His life has been written by Theodore Martin (Lond. 1867).

AYUNTAMIENTO is the name given in Spain to the councils or governing bodies of towns. Sprung from the institutions of the Romans, and firmly established during the long struggles with the Moors, the ayuntamientos acquired great influence and political power, the more so that the nobility were not excluded from them. Although this importance was impaired through the insurrection of Juan de Padilla in 1521; and at a later period, under the Bourbons, the last shadow of municipal freedom was lost; the remembrance of it continued to be cherished by the people. Accordingly, the cortes of Cadiz, in 1812, took up the leading features of the former system, adapting them, by more democratic modifications, to the requirements of the time. On the return of Ferdinand VII., the ayuntamientos were abolished; they were again restored by the cortes, in 1823; and after the invasion by France, once more set aside. During the civil war, various proposals were made regarding the ayuntamientos; but at last the arrangements of 1812 were confirmed by the constitution of 1837. According to that statute, the A., with the alcalde as president, is appointed by the free choice of the people, and is entitled to exercise the highest functions within the circle of its jurisdiction. The government can provisionally annul its acts, but must afterwards procure the ratification of the cortes, by which alone an A. can be dissolved. The ayuntamientos are empowered to

make up the lists of electors and jurors, to organize the national guards, to command the police within their own bounds, to direct the apportionment and raising of taxes, and to manage the funds of the commune. In 1840, a bill was brought into the cortes, formed on the model of the French law, proposing to deprive the ayuntamientos of all political power, and restrict their functions to purely municipal matters, and also to limit the franchise to the most highly taxed. But the insurrection which this step excited, and which ended in the expulsion of the queen, Maria Christina, prevented the project from being carried out. At last, in 1844, a law, similar to that proposed in 1840, was, through the intriguing of Christina, supported by French influence, adopted by the cortes, then composed of moderados; and this law, with little alteration, continues in force to the present day.

AZAD'IRINE, a bitter extract sometimes used in place of quinine. It is got from the bark of an East Indian tree known in America as the "Pride of China"

AZAIS; PIERRE HYACINTHE, 1766–1845; a French author and philosopher. He was a teacher in the college at Tarbes, but not liking the duties he became secretary to the bishop of Oleron; he soon gave up the place, and supported himself by playing the organ in a church. When the revolution of 1792 broke out, A. was one of its warmest advocates, but the horrors perpetrated made him a vehement opponent, and a pamphlet severely condemning the movement made immediate flight necessary. He returned to Paris in 1806, and in 1809 published his *Des Compensations dans les Destinées Humaines*, an optimist's view that good and evil are about fairly balanced, and that it is the duty of good citizens to submit to a fixed government. The idea naturally pleased Napoleon, who made A. professor at St. Cyr. At a later period he was in the public libraries at Avignon and Nancy. His Bonapartism kept him out of place for some years after the restoration, but he finally got a pension which placed him beyond the reach of want. According to A., all existence, whose cause is God, is the product of two factors, matter and force. Matter consists of primitive atoms. Force is expansive and subject to the law of equilibrium. All the phenomena of the universe are successive stages of the development of this one force acting on the primitive atoms; and this is traced in three orders of facts: 1, the physical; 2, the psychological; and, 3, the intellectual, moral, and political. In the physical, development can be traced from the simplest mechanical motion up through the more complex forces of light, heat, and electricity to the power of magnetic attraction, by means of which the second great order of facts is produced out of the first; for magnetic force acting on elastic bodies creates the primitive living globule, which is shaped like a tube open at both ends. From this first vital element a gradual ascent can be traced, culminating in man, who differs from other animals in the possession of intellect, or consciousness of the ideas which external things impress upon him. The immaterial in man, or his soul, is the expansive force inherent in him. Moral and political phenomena are the results of two primitive instincts, progressive and self-conservative, corresponding to the forces of expansion and represssion. From the reciprocal relations of these instincts may be deduced the necessary conditions of political and social life. The ultimate goal of life is the fulfillment of the law of equilibrium, the establishment of universal harmony. When that is accomplished, the destiny of man will have been achieved, and he will vanish from the earth, and that event may be looked for in 7000 years. For establishing complete universal equilibrium, 5000 years more will be requisite, at which period the present system of things will end.

AZA'LEA, a genus of plants belonging to the natural order *Ericeæ*, and distinguished from rhododendron (q.v.) chiefly by the flowers having five stamens instead of ten. Most of the species of A. also differ from the rhododendrons in having thin deciduous leaves. Some botanists unite the genus *A.* to *rhododendron*. One of the species best deserving of notice is *A. pontica*, a shrub from 3 to 5 ft. high, a native of the countries around the Black sea, with large obovate or oblongolanceolate shining leaves and umbellate yellow flowers, which are externally covered with glutinous hairy glands, and are very fragrant. It may be regarded as, like many of the other *ericeæ* (heaths, etc.), a *social* plant; and its golden flowers give great brilliancy to the landscape in many parts of the Crimea, the s.e. of Poland, the Caucasus, etc. It covers many mountain slopes, but does not ascend to great elevations, giving place to the more alpine *rhododendron ponticum*. It is common in gardens and shrubberies in Britain, and varies with orange, red, and almost white flowers. The whole plant is narcotic and poisonous, and the honey collected by bees from its flowers, which very much abound in honey, is said to cause stupefaction and delirium, as happened to Xenophon's soldiers in their famous retreat in Asia.—North America abounds in azaleas as well as in rhododendrons, and some of the species have been long cultivated in Britain, particularly *A. nudiflora* and *A. viscosa*, which, with *A. pontica*, have become the parents of many hybrids. Both have nearly white flowers, very beautiful, and of delicious fragrance. *A. viscosa* has the flowers covered with glutinous hairs like *A. pontica;* but the flowers of *A. nudiflora* are nearly destitute of them. Both species abound from Canada to the southern parts of the United States. They are taller shrubs than *A. pontica*. Upon account of its sweet smell, *A. nudiflora* is called in America the upright honeysuckle. *A. calendulacea*, a native of the southern parts of the United States, is described as frequently clothing the mountains with a robe of living scarlet.—India and China produce several

species of A., of which one of the finest is *A. Indica*, well known in Britain as a greenhouse shrub. Its flowers exhibit great brilliancy of colors. Many hybrids exist between the more hardy species and this. Another extremely beautiful species is *A. ledifolia*, an evergreen, which has been introduced into Britain from China.

A diminutive, procumbent, evergreen shrub, a native of alpine regions in Europe and North America, plentiful on high mountains in Scotland, was long known as *A. procumbens*, but is now called *Loiseleuria procumbens*. The flowers are small and rose-colored. The whole appearance of the plant widely differs from that of the genus of Azalea.

AZARA, Don Felix de, 1746–1811; a Spanish general; wounded in a fight with the pirates of Algiers in 1775. Six years afterwards he was one of the commissioners to settle the boundaries between the Spanish and Portuguese settlements in South America. He was there for twenty years, and developed a strong taste for natural history, publishing an important work on the *Quadrupeds of Paraguay* in Paris in 1801. His chief work, issued in 1809, is the story of the discovery and conquest of Paraguay and the river La Plata.

AZARI'AH, a frequent name among the Hebrews, signifying "helped by Jehovah." Eleazer has the same meaning. A number of A.'s are mentioned in the scripture, the most important being the prophet who met Asa on his return from a victory over the Cushites, and warned the king to suppress the worship of idols; 2, a son of Jehoida, who made special effort to restore the worship of the temple and put down Athaliah's usurpation; 3, a high priest who assisted Hezekiah in purifying the services of the temple; 4, called in Chaldaic "Abednego," one of the three cast into the fiery furnace.

AZAZEL, the word inscribed upon the lots cast by the high priest of the ancient Hebrews on the day of atonement, to determine which of the goats selected for a sin-offering should be the scape-goat, and which one should be sacrificed. Critics are unable to decide upon the meaning of the word.

AZE'GLIO, Mas'simo Marquis d', famous as an artist, a publicist, a romance-writer, and a statesman, was the descendant of an ancient and noble family of Piedmont. He was b. in 1798 at Turin, where his father held a high military position. In his fifteenth year, A. followed his father to Rome, where he had been appointed ambassador, and there contracted a love for the fine arts: but his study of music and painting was cut short by his father procuring him an appointment in a Piedmontese cavalry regiment. Here A. devoted his leisure with such intensity to scientific pursuits, that he brought on an illness which forced him to quit the service. A journey to Rome, from which he returned to Turin in 1820, restored his health, but deepened his passion for painting. After some difficulty, he got his father's permission to devote himself entirely to this art. A year had hardly elapsed ere A. had made himself a name in Rome as an artist. In landscape-painting he soon attained complete artistic skill. After a residence of eight years at Rome, during which he had pursued the study of history along with painting, he returned to Turin. On the death of his father in 1830, he went to Milan, where painting was then flourishing. In Milan he made the friendship of Alexander Manzoni, whose daughter he married. A. now began to make himself favorably known also in literature, his novels, *Ettore Fieramosco* (1833) and *Niccola di Lapi* (1841), having done much to fan the national spirit of the Italians. The political affairs of Italy soon occupied him exclusively; he traversed the provinces, cities, and villages, seeking to stir up the spirit of patriotism, and to conciliate the unhappy party divisions, and was everywhere received with rejoicing and acclamation. A. never belonged to a secret political society, but opposed conspiracies as mischievous, and exhorted the impatient to moderation. While in Florence, he wrote his famous piece, *Degli ultimi Casi di Romagna*, in which he lashed the miserable papal government, denounced the vain attempts at insurrection, and proved to the Italian princes the necessity of a national policy. After the election of Pius IX. as pope, A. returned to Rome, and to his influence were ascribed the reforms with which Pius began his government. He was intensely active at this time, and wrote much on public questions. (An edition of his political writings, collected in one volume, appeared at Turin 1851.) When Charles Albert, after the rising of Lombardy, crossed the Ticino, A. left Rome with the papal troops destined to support the Italian contest. In the battle of Vicenza, where he commanded a legion, he was severely wounded in the leg while fighting at the head of his troops. Scarcely was he recovered, when with his pen he courageously opposed the republican party, now intoxicated with victory. On the opening of the Sardinian parliament, he was chosen a member of the chamber of deputies. After the unfortunate event of the battle of Novara, the young king, Victor Emanuel II., appointed him (1849) president of the cabinet, an office which he undertook solely out of love to his king and country. His influence in this high position was most beneficial. At the close of the war in 1859, A. was appointed *pro tempore* general and commissioner extraordinary, purely military, for the Roman states. On his retirement, he issued a proclamation to the people, which greatly tended to strengthen their resolution by its noble yet temperate advice. He died on the 15th of Jan., 1866. Since his death, *Political Correspondence*, and other writings from his pen, have been given to the world; and his *Autobiography* has been published by his daughter.

AZERBIJAN', or ADERBAIJAN', the ancient *Media Atropatene*, is the most northerly province of Persia. It is situated between lat. 36° and 40° n., long. 44° and 48° 40′ e.; bounded on the s. by Persian Kurdistan and Irak, e. by Ghilan, n.e. and n. by the Russian territory, and w. by Turkish Kurdistan. It has an area of about 30,000 sq.m., and a pop. of 2,000,000. The surface of A. is very mountainous, many of the ranges rising from 7000 to 9000 ft. in height. The peak of Savalan (an extinct volcano) reaches an elevation of 13,000 ft. Mt. Ararat rises on the n.w. border. The chief rivers of A. are Aras or *Araxes*, the Kara Su, and the Kizil-Uzen. The salt lake Urumiyah or Urumieyeh (q.v.), the largest in Persia, is situated on the western border of the province. The climate of A. is not unhealthy, but it is subject to the extremes of heat and cold. The transition from cold to heat is very rapid. In the mountainous districts, the hail-storms are occasionally so violent as to kill cattle. The principal products of A. are rice, barley, wheat, maize, flax, hemp, cotton, tobacco, honey, and saffron; camels, horses, cattle, and sheep are also reared; velvet, silks, stuff, carpets, woolens, and leather are the most important articles of manufacture, and a little is done in hardware. Lead, iron, copper, sulphur, saltpetre, and salt are found in the province. The capital of A. is Tabriz, with a pop. of about 120,000. It has suffered greatly from earthquakes. The other towns of note are Urumiyah, on the lake of that name; Maragha, famous as the place where Nasir Eddin, the astronomer, fixed his observatory; Miana, Khoi, Selmas, and Ardebil.

AZEVE'DO COUTIN'HO, JOZÉ JOAQUIM (DA CUNHA), 1742–1821; the last inquisitor general of Portugal. He was bishop of Pernambuco in 1794, and became noted in 1798 for publishing in London an argument against the suppression of the slave trade. He was appointed inquisitor general in 1818. He is the author of a narrative of the conquest of Rio Janeiro in 1711 by Duguay-Trouin.

AZEVE'DO Y ZUNIGA, GASPARD DE, d. 1606; Count of Monterey and viceroy of Mexico and Peru. He fitted out an expedition under Pedro Fernandez de Quiro to search for the supposed great continent in the s. polar ocean. Some small islands were found, but not the continent.

AZIMABA'D, or TIROWLI, a t. of Sirhind, India, in 29° 48′ n. lat., and 77° e. long., on the route from Kurnal to Lodiana, 9 m. n.w. from Kurnal. Its site is slightly elevated above the neighboring plain, which is inundated in the rainy season. It is surrounded by a high brick wall, pierced with loopholes for musketry, and having bastions surmounted with a tower. A large caravansery is inclosed with a lofty embattled wall having a tower at each corner, and surrounded by a deep ditch, capable of being filled with water.

AZIMGHUR', or AZIM'S FORT, a name primarily applied to a t. in India, and thence extended to its district, forming one of the n.w. provinces. 1. The t. is in lat. 26° n., and long. 83° 14′ e. From Calcutta, it is 448 m. to the n.w.; from Benares, 81 to the n.; from Allahabad, 109 to the n.e.; and from Lucknow, 171 to the s.e. It is situated on the north-eastern Tons, a considerable offset of the Gogra, which is here crossed by a bridge of boats, and which is navigable downwards a distance of 40 m., to its confluence with the Surjoo. The t. contained, in '71, about 14,000 inhabitants, besides the troops in garrison. During the mutiny in 1857, A. was so far, a creditable exception to the general rule of ruthless cruelty among the insurgents. The sepoys did indeed mutiny, actuated, apparently, by a wish to appropriate a passing treasure of 7 lacs of rupees, or £70,000 sterling. But having formed a square round their officers, and sworn to protect them, they brought carriages for them and their families, and escorted the whole 10 m. towards Ghazeepore.—2. The district stretches in n. lat. between 25° 36′ and 26° 24′, and in e. long. between 82° 45′ and 84° 12′. Its area is stated to be 2550 sq.m.; and its pop., '71, to be 1,531,410. This gives the average of 600 persons to the sq.mile. This exceptionally high average is the more remarkable from the circumstance that there are few, if any, populous t. in the district besides the capital. The district is low and remarkably level. The soil is fertile, excepting that a few tracts are irreclaimably barren, from being impregnated with soda, nitre, and other saline substances. Magnificent crops of rice, sugar-cane, and indigo are produced. The principal manufactures are those of silk and cotton, the value of which amounts to more than £100,000 a year.

AZIMUTH. The A. of a heavenly body is the angle measured along the horizon between the n. or s. point, and the point where a circle, passing through the zenith and the body, cuts the horizon. The word comes from the Arabic, and is said to be derived from a word signifying a quarter of the heavens. It is usual to measure the A. westward from the point most remote from the elevated pole, beginning at 0°, and returning to it at 360°. Thus, in northern latitudes, where the n. pole is elevated, the A. is measured from the s. point, so that the e. point, for instance, has an A. of 270°. See ARMILLARY SPHERE. A. circles are those which extend from zenith to nadir, cutting the horizon at right angles, or those in which all the points have the same azimuth.

A'ZINCOURT, or AGINCOURT, a village in the department of Pas-de-Calais, France, celebrated for a bloody battle between the English and French, Oct. 25, 1415. The internal distractions of France under the imbecile Charles VI. (q.v.) had encouraged England to attempt to make good her ancient claim on France. Henry V. of England

had landed at Harfleur, had taken that fortress, and wished to march through Picardie to Calais, in order to get into winter-quarters. The dauphin advanced against him with a powerful force. A great number of the nobility accompanied him; and so great was their confidence, that the offered aid of the duke of Burgundy and of the city of Paris was rejected. Henry hastened to the Somme, but was followed by the French, who opposed his passage; he at last managed to cross with his army at St. Quentin. Greatly weakened in numbers, and suffering extremely from want of provisions, Henry offered to purchase peace by reparation of injuries. But the French would not hear of a treaty; as they entertained the hope of completely annihilating the English army. They had, in fact, intercepted the English march to Calais, by getting possession of the high road behind the little river Ternoise, near the villages of A. and Framecourt. The invading army, therefore, still (according to French accounts) 14,000 strong, of whom 2000 were men-at-arms—though no English writer makes it more than 10,000—prepared for an engagement by posting themselves between two woods, in a single line of battle, with the archers on the wings. The French, to the number of 50,000, under the command of the constable D'Albert, were drawn up in two lines, the men-at-arms, of whom only 2000 were mounted, being in the first. The English were the first to begin the onset. The French cavalry rushed forward to meet them, but were received with such a storm of arrows that they took to flight, threw themselves upon the first line and put it in disorder. On this, the light-armed English archers took to their billhooks and hatchets, broke into the ranks of the men-at-arms that fought on foot, whose heavy armor and close array rendered them almost incapable of resistance, and made the greatest havoc among them. This being followed by a charge of the English horsemen, the first line took to flight, the second was unable to arrest the victors, and the whole French army was soon completely dispersed. The victory was decided. For a moment, Henry believed that the rallying masses were going to renew the fight; and hearing also that a troop of armed peasants were plundering his baggage, he gave orders to slay all the prisoners taken. The order was already executed when he discovered the groundlessness of his alarm. As many as 10,000 Frenchmen were slain, among whom were the constable and six dukes and princes, the duke of Brabant, the count of Nevers, the duke of Alençon, the duke of Bar and his two brothers. Five princes, among them the dukes of Orleans and Bourbon, were taken prisoners. The English lost 1600 killed, including the duke of York, the king's great-uncle, whom the duke of Alençon slew. Alençon had even struck the crown from king Henry's head, when he was surrounded by all present, and fell with many wounds. Henry, however, was too weak to pursue his advantage, and therefore continued his march to Calais, where he embarked for England.

AZO, PROFESSOR, a distinguished professor of civil law in the university of Bologna, in the early part of the 13th century. A. was one of the most eminent of the glossists, or commentators, of his time, and Savigny calls his works the mort important of that school which have come down to us. The name is sometimes given to Azzo, or Azzolenus; also Azo Soldanus, from the surname of his father.

AZO'IC AGE, that period of geological time preceding the appearance of vegetable or animal life on earth. Constantly occurring discoveries render it impossible to fix a limit for the close of the age.

AZORES', a cluster of islands in the Atlantic, 800 m. due w of the southern half of Portugal, ranging in n. lat. between 36° 55′ and 39° 44′, and in w. long. between 25° 10′ and 31° 16′. In the first half of the 15 c., the A. were discovered by the Portuguese, or rather, it has been said, appropriated by them, after having been revealed to them by a Flemish navigator, Joshua Vanderberg, of Bruges. They were at that time uninhabited —a fact which, so far as it goes, seems adverse to any notion that America could have been colonized from Europe in this direction. That the A. were visited by the Carthagenians is proved by Phœnician coins found on Corvo. As early as 1436, they are marked on a map of the world by the Venetian Andrea Bianco. The Portuguese colonists called the whole group A., from *acor* or *azor*, a hawk; and they named the two individual islands Corvo and St. Jorgo, from Corvos Marinos and St. Jorsi, which, according to the maps of the 14th c., had been previously seen in the western ocean. In 1466, Alfonso V. made a life-grant of the island of Fayal to his aunt, the duchess of Burgundy, and from this circumstance many settlers migrated thither from Flanders. Without reckoning mere rocks, the islands are nine in number. Taken from e. to w., they are as follows: St. Mary, St. Michael, Terceira, Graciosa, St. Jorgo, Pico, Fayal, Flores, and Corvo. The area of the group is estimated at 980 sq.m.; while its pop. is '72, 260,072; yielding an average of 265 to a sq.mile. In the order of pop. and importance, the islands stand thus: St. Michael, Terceira, Pico, Fayal, St. Jorgo, Flores, Graciosa, St. Mary, and Corvo. Their capital is Angra, in Terceira; but Ponta Delgada and Ribeira Grande, both in St. Michael, are larger towns.

As may be presumed from the density of the population, the soil is fertile, and the climate healthy. The islands are also well watered. The exports are oranges, wine, brandy, grain, pulse, pork, beef, cheese, and coarse linens; and the imports are woolens, cottons, hardware, iron, glass, cordage, pitch, tar, staves, timber, oil, fish, rum, coffee, sugar, salt, and tea. Perhaps the greatest want of the group is a good harbor.

The A are of volcanic origin—a fact from which may probably be inferred their identity with the isles of Brazil or of Fire in the maps above mentioned, of the 14th century. Though most of the volcanoes themselves appear to be extinct, yet the islands contain hot springs, and are subject to violent earthquakes. The coasts are generally steep and rugged, while the interior parts abound in ravines and mountains. The mountains range from 1869 ft. to 7613—the latter being the height of the lava-covered *peak* which gives name to *Pico*.

AZOTE' (Gr. *a*, depriver of, and *zōē*, life) is the name given by French chemists to nitrogen (q.v.).

AZOTH, the panacea of Paracelsus, regarded by his followers as "the tincture of life."

AZ'OTIZED BODIES are those substances which contain azote or nitrogen as one of their constituents, and which form part of the living structure of a plant or animal, or are produced during its natural decay. The principal members of the group are *albumen*, present in white of eggs, and the juices of plants and animals; *globuline*, or *crystalline*, a variety of albumen found in the lens of the eye; *vitelline*, another variety of albumen, composing the greater bulk of the yolk of the egg; *paralbumen*, a third variety of albumen found in the animal system during certain diseases; *fibrine*, which occurs largely in the seeds of cereals and in animal muscle; *caseine* (or cheese matter), present in all milk; *legumine*, a variety of caseine found in pease, beans, and leguminous seeds in general; *gelatine*, which is present in the skin, bones, and other parts of animals; *chondrine*, a variety of gelatine obtainable from the cornea of the eye and the permanent cartilages; *isinglass*, another variety of gelatine manufactured from the inner membrane of the floating bladder of sturgeons and other fishes; *glue* and *size*, which are secondary forms of gelatine; *urea*, *uric acid*, and *hippuric acid*, which are present in the urine of the higher animals; *kreatine* and *kreatinine*, occurring in the juice of flesh; several forms of *urinary calculi*, which are found as stones in the bladder; and the very large and important class of *alkaloids*, including strychnine, morphine, quinine, etc. The principal members of the series of A. B. will be considered under their special headings; and the use of several of them as articles of diet will come into notice under FOOD.

AZO'TUS, the *Ashdod* of the Old Testament (now Esdud), a village on the Mediterranean, 21 m. s. of Jaffa. Lat. 31° 45′ n., long. 34° 37′ e. It was formerly one of the chief cities of the Philistines, strongly fortified, and the scene of numerous contests between that race and the Jews. Into this city the ark of the covenant was brought by the Philistines, and placed in the temple of their god Dagon, whose image fell in pieces before it. In the 8th c. B.C., the town fell into the hands of the Assyrians; and in the following century was captured by the Egyptians, after a 29 years' blockade and siege. In the wars between Alexander Balas and Demetrius, A. was destroyed by fire. It was afterwards rebuilt by the Romans, but never regained its early importance. It has now a pop. of about 300, and the sea is gradually receding from its harbor.

A'ZOV, or A'sow, a fortress and port t. in the s. of Russia, situated on the Don, about 20 m. from its mouth. The sand and mud deposited by the river have choked up the port, so that its trade and shipping have dwindled away, and the inhabitants now depend mostly on fishing. Pop. '67, 14,017. A. was anciently a Greek colony, under the name of Tanaïs, and carried on extensive commerce with the northern peoples. In number of inhabitants and in wealth it often rivaled Panticapæum (now Kertch). In the 13th c. it was taken possession of by the Genoese, who called it Tana. They were driven out of it by Timur (Tamerlane) in 1392. In 1471, it was taken by the Turks, and since then has borne the name of A., the Turks calling the town and the neighboring sea Asak. After an obstinate struggle, at which Peter the great, then beginning his career, was present, it was captured by the Russians about the end of the 17th century. It more than once fell again under the dominion of the Turks, but at last, in 1774, remained in the undisturbed possession of Russia. It was bombarded and destroyed by an allied English and French squadron in 1855.

A'ZOV, SEA OF, named after the town, is a large gulf of the Black sea, formed by the peninsula of Crimea, or rather an inland lake connected with the Black sea by the long narrow strait of Kaffa. The Siwash or Putrid sea is the western portion of the sea of A. cut off by the long narrow slip of low sandy land called the tongue of Arabat. The entrance to the Putrid sea is by the narrow strait of Genitschi at the n. of the Tongue. The Putrid sea is little but a succession of swamps. The ancient name of the sea of A. was Palus Mæotis. It gets the name of Balik-Denghis, or Fish-sea, from the Turks and Tartars, from its abundance of fish. The water is almost fresh. The whole sea is shallow, and occupies an area of about 14,000 sq. miles. During the Crimean war, an expedition, having on board 16,500 English, French, and Turks, was sent to this sea in May, 1855, which devastated the ports, and cut off supplies intended for Sebastopol.

AZPEI'TIA, a fortified t. in Spain on the Urola, 15 m. s.w. of San Sebastian; pop. 5300. During the Carlist movements in 1870–74, A. was the seat of the court for the management of the war; and the famous monastery of San Ignacio, dedicated to Loyola, was used for military purposes. The birthplace of Ignatius Loyola was near the town.

AZRAEL, in Jewish and Mohammedan belief, the angel who attends the dying, and separates the soul from the body.

AZTEC CHILDREN. In the year 1853, there were brought over to this country from America two diminutive children, a boy and a girl, said to be aged respectively 17 and 11, and who were represented as descendants of the ancient Aztecs. The height of each was under 3 feet. Their figure was slender and not ill proportioned; that which was chiefly remarkable being their features. While the forehead and chin receded, the nose was so singularly prominent as to suggest the idea of the face of a bird. Yet, with dark lively eyes, an olive complexion, and glossy long black hair, and a great fund of good-nature, they were far from unpleasing. They spoke no intelligible language, but understood a few words of English, and seemed to have a taste for music. Shown to the public as curiosities, they were usually exhibited on a large table, on which they ran about amusing themselves. Their exhibitor told a very incredible story of how they had been obtained from the ancient city of Iximaga, where they were reverenced as gods. A certain señor Velasquez, accompanied by a Canadian and an American, penetrated into this ancient city of Central America, where they made the acquaintance of one of the guardian priests of these undersized deities, who was so charmed with the accounts of the outer world, that he resolved to steal the gods of his people, and escape with the strangers. One after the other—the Canadian, the American, and the priest—were overtaken by disaster, and Velasquez alone was left to tell the wondrous tale, with no attestation but such as the children themselves furnished. Prof. Owen considered them mere dwarfs, and other authorities held a similar opinion. Belonging probably to some Indian tribe, they were doubtless monstrosities; and this becoming apparent, interest in them ceased.

AZTECS. The name of the dominant tribe in Mexico at the time of the arrival of the Spaniards. See MEXICO, ANTIQUITIES OF.

AZU'A, a t. of the island of San Domingo, not far from the s. coast, on the Bia, and near its mouth, 60 m. w. from St. Domingo. Pop. 6000.

AZUA'GA, a t. of Estremadura, Spain, in the province of Badajos, 20 m. e. from Llerena. It is situated in an elevated district, drained by the head-waters of the Matachel, a branch of the Guadiana; the surrounding country produces much grain, is partly covered with extensive oak forests, and contains large tracts of heath, bright in summer with the blossoms of different species of *cistus*. Pop. 6400.

AZU'NI, DOMENICO ALBERTO, a distinguished jurist, b. at Sassari, in the island of Sardinia, Aug. 3, 1749. He early applied himself to the study of law, devoting himself particularly to the maritime relationships of nations. He became judge of the tribunal of commerce at Nizza or Nice; and in 1795, after that city had been taken by the French, he published a work in which he endeavored to reduce maritime laws to fixed principles, and which, being recast, was published at Paris in 1805 under the title of *Droit Maritime de l'Europe*. The work was sufficiently anti-British in tone to secure its author the favorable consideration of Napoleon's ministry, by whom he was appointed one of the commissioners for compiling the new commercial code, the maritime portion being allotted to him. Genoa having been annexed to France, A., in 1807, was appointed president of the court of appeal there, where he remained until the fall of Napoleon. Among other things, A. published an *Essai sur l'Histoire Géographique Politique et Morale de la Sardaigne*, and a *Dictionary of Mercantile Jurisprudence*, and some controversial brochures. For some time after he had withdrawn from Genoa, he resided at Nice, and afterwards in his native island, where he was appointed, by king Charles Felix, judge of the consulate of Cagliari, and librarian to the university of that city. He died in Jan., 1827.

AZURE, a French word technically used in heraldry to signify blue. In engraving arms, it is always represented by horizontal lines.

AZ'URINE, *Leuciscus cæruleus*, a fish of the same genus with the roach, chub, etc., and most nearly resembling the red-eye (q.v.) or rudd (*L. erythrophthalmus*), from which, however, it is readily distinguished by the slate-blue color of the back, and the whiteness of the abdomen and fins. It is a fresh-water fish, and was first described by Yarrell from specimens received from Lancashire, where it is called the blue roach, but it is also an inhabitant of some of the lakes of Switzerland.

AZ'URITE, a name which has been given to the mineral more commonly called lazulite (q.v.), and to which, along with lapis lazuli (q.v.) or *azure-stone*, mineral turquoise (see TURQUOISE), etc., the generic name, *azure spar*, is sometimes given. The name A. is also given by mineralogists to an ore of copper, generally known as *blue copper* (see COPPER), nearly allied to malachite (q.v.), and remarkable for its beautiful azure color.

AZ'YMITES, the name given by the eastern to the western church, arising from a difference about the use, in the Lord's supper, of leavened or unleavened bread. The western, or Latin branch, insisted that unleavened bread might be used, and the Greek church stigmatized the Latins as "azymites," from the Greek *a*, "not," and *zume*, "leaven." The Latins retorted with "pro-zymites," but the terms, intended for reproach, soon passed, with the whole discussion, into history as useless additions to polemical nomenclature.

B

B THE second letter in the Hebrew or Phœnician alphabet, and in all alphabets derived from it, belongs to the order of labials, and is of the kind called medial or flat. See LETTERS, ALPHABET. Its name in Hebrew is *beth*, signifying "house." probably because its original hieroglyphic or picture form was an outline of a house or tent. In the corresponding words of sister-languages, we find *b* very generally replaced by some one of the other labial letters [*p*, *f* (*ph*), *v*]; these substitutions, however, take place not by chance or caprice, but according to ascertained laws. See PHILOLOGY, COMPARATIVE, and GRIMM'S LAW. The following are some examples of the interchange of *b* with other letters: Corresponding to Eng. *bear* are Sansc. *bhri*, Lat. *ferre*, Gr. *pherein:* Eng. *be*, Sansc. *bhu*, Lat. *fio* and *fui*, Gr. *phuo:* Eng. *bore*, Lat. *forare:* Eng. *of* and *off*, Gr. *apo*, Lat. *ab:* Eng. *wife*, plural *wives*, Ger. *weib*, Old H. Ger. *wip:* Eng. *web*, *weave*, *weft:* Gr. *episcopos*, Eng. *bishop*, Fr. *evêque*. In several Latin words, *b* arose out of *u* (pronounced like *v* or *w*). Thus, the original form of *bellum*, war, was *duellum* or *dvellum:* of *bonus*, *dvonus:* and the *d* being dropped (as we drop the sound of *k* in *knee*), the *v* became hardened into *b*. Similarly, *bis*, twice, is for *duis*. A remarkable interchange sometimes takes place between *b* and *m*, as in Sansc. *mri*, to die; Lat. *mort-*, death; and Gr. *brotos*, mortal.

The Greeks pronounced their *b* (*β*) like a *v*, for they spelled *Virgilius*, e.g., *Birgilios;* and this continues to be the case in modern Greek. In Latin, during the classical ages at least, the letter was pronounced as it is in English, French, etc. But in the time of the later emperors (beginning with the 3d c. of our era), *b* was softened down, in the popular language at least, to a slovenly sound like *v*; for in inscriptions of this period, such spellings as *verva* for *verba*, *miravili* for *mirabili*, are quite common. The distinction between the two sounds being once lost sight of, the letter *b* was frequently substituted for *v*—as *berba* for *verba*, *bivus* for *vivus*. This softening of *b* into *v* in the middle-age Latin, has left traces in the modern Italian and French; as Lat. *habere*, Ital. *avere*, Fr. *avoir;* Lat. *tabula*, Ital. *tavola*. A Spaniard, on the contrary, has a tendency to use *b* instead of *v*; thus he pronounces *vivere* like *bibere*, and *Jovis* as if written *Jobis*.

B, in music, is the seventh degree of the diatonic scale of C, and the twelfth degree of the diatonic-chromatic scale. In harmony, it is called the major seventh. According to the tempered system of tuning, the ratio of B, to the fundamental note C, is $\frac{8}{15}$. In the ancient diatonic scale, B was never used as a key-note, as its fifth, F, was imperfect. In the German notation, B is called H, while B flat is called simply B. B flat is half a tone lower that B, and in harmony is called the flat seventh. As a harmonic arising from C, B flat, as produced by nature, is considerably flatter than in the tempered system of tuning.

BAA'DER, FRANZ XAVER VON, 1765–1841; a German theologian. He was the third son of the court physician, and his elder brothers were distinguished, Clemens as an author, and Joseph as an engineer. Franz graduated at the university of Ingolstädt in 1782; assisted his father in medicine, but disliked the profession; studied engineering in the mining districts, and lived four years in England, where he became acquainted with rationalistic philosophy, which he thought little less than satanic. The religious speculations of Eckhart, St. Martin, and especially Böhme, were more to his mind. He held intimate friendship with Jacobi, and learned something of Schelling. Though deeply interested in philosophy, he kept to his engineering practice, became superintendent of mines, and was ennobled for valuable services. His first published work was *Fermenta Cognitionis*, in which he combated modern philosophy, and recommended that of Böhme. In 1826, he was appointed professor of philosophy and speculative theology in the new university of Munich. Some of his lectures, while occupying that chair, have been published. In 1838, he opposed the interference in civil matters of the Roman Catholic church, to which he belonged, for which opposition he was interdicted from lecturing on the philosophy of religion during the last three years of his life. He also favored a reconstruction of the church—a church without a pope. B. is considered to have been the greatest speculative Roman Catholic theologian of modern times, and his influence has gone beyond the bounds of his own church.

BA'AL, a Hebrew word signifying *lord*, *owner*, or *master*, and applied as a general title of honor to many different gods. In Hosea ii. 16, it is mentioned as a name which had been given to Jehovah himself; but when used with the definite article, it specially designated the principal male deity of the Phœnicians and Carthaginians, as Baaltis or Astarte was the principal female deity. In connection with Babylon and Assyria, the same deity is spoken of under the name of Bel or Belus. Originally, B. was the god of the sun, the ruler and vivifier of nature, and Astarte the goddess of the moon. In the later star-worship of the western Asiatic nations, B. was the name of Jupiter, the planet of fate, or, as some suppose, of Saturn. The proper Phœnician name of B., however, was Melkart, Melkrat, or Melchrat, which is usually supposed to mean "king of the city"—i.e., Tyre; but others consider it a contraction of two words signifying "king

of the earth;" while the learned Selden is of opinion that it is equivalent to "strong king." B. was perhaps the same god as the Phœnician Moloch. The Greeks confounded B. or Melkart with their own Hercules; and, for the purpose of distinction, termed him the Tyrian Hercules. From the earliest foundation of Tyre, he seems to have been the tutelar god of that city, and his worship apparently extended thence until it was prevalent in all the towns of the Phœnician confederation, and was established in their remotest colonies, such as Malta, Carthage, and Cadiz. It also overspread the neighboring countries of Assyria and Egypt. Each country or locality had its B. or chief god. According to Scripture, the temples of this idol (at least in Phœnicia and Assyria) were built on the tops of hills, or still more frequently in solemn groves, and sometimes altars were erected to him on the roofs of houses. His priests were numerous. Incense was the most frequent offering presented to him, but we also read of sacrifices of bullocks, and even of children. In 1 Kings, chap. xviii., we read that the priests of B. danced about the altar during the sacrifice, and barbarously cut and mangled themselves, if their god did not speedily answer their prayers.

The word B. enters into the composition of many Hebrew, Chaldee, Phœnician, and Carthaginian names, such as Jezebel, Hasdrubal ("Help of Baal"), Hannibal ("Grace of Baal"), Ethbaal ("With Baal"), Baal-bec ("City of Baal"). The word is also frequently found in conjunction with some epithet, and in such cases appears to have denoted a different deity, though it is not impossible that it may have been the same person regarded in another aspect, and as exercising merely a different function. Thus, we have Baal-Berith, "the Covenant Lord," who was specially worshiped by the people of Shechem; Baal-Peor, the *Priapus* of the Moabites and Midianites; and Beelzebub, or Baalzebub (the Fly-god), the idol of the Philistines at Ekron, where he had a temple.—The Celtic deity Beal is usually identified with Baal. See BELTEIN.

BAAL'BEK, the name of a ruined city in the ancient Cœle-Syria, signifies the "city of Baal," the sun-god, and was by the Greeks, during the Seleucide dynasty, converted into Heliopolis. Lat. 34° 1′ 30″ n., long. 36° 11′ e. It is situated in the plain of Bukâ'a, "at the northern extremity of a low range of bleak hills, about 1 m. from the base of Antilebanon," in a well-watered and delightful locality, rather more than 40 m. n.w. of Damascus. It was once the most magnificent of Syrian cities, full of palaces, fountains, and beautiful monuments. It is now only famous for the splendor of its ruins, of which three deserve special notice. The most imposing is that of the great temple of the Sun, which was a rectangular building, 290 ft. by 160, having its roof supported by a peristyle of 54 Corinthian columns, "19 at each side, and 10 at each end." Of these, 6 are yet standing. The circumference of these columns is about 22 ft., and the length of the shaft 58; with pedestal, capital, and entablature, they measure about 89 ft. in height. The approach to this temple was through two spacious courts, surrounded on all sides with porticoes and other buildings. Except the columns mentioned, little of the great temple, or of the buildings in front of it, is left standing, but the ground is covered with their ruins. The vast size of the stones used in the substructions is remarkable, some of them being 60 ft. long and 12 thick. South from the great temple is a smaller one, known as the temple of Jupiter. It is similar in form, having its peristyle and the walls of its cella still mostly standing. Its dimensions are 227 ft. in length, by 117 ft. in breadth, being thus larger than the Parthenon at Athens. Both temples, as well as the surrounding structures, are built of limestone, in a richly decorated somewhat fantastic Corinthian style. Besides these, there stands at the distance of 300 yards from the others a circular building, supported on six granite columns; style, mixed Ionic and Corinthian. It was once used as a Christian church.

The early history of B. is involved in darkness; but it is certain that, from the most distant times, it had been a chief seat of sun-worship, as its name implies. Julius Cæsar made it a Roman colony, and under Augustus it was occupied by a Roman garrison. B. had an oracle held in such high esteem that, in the 2d c. A.D., it was consulted by the emperor Trajan prior to his entrance on his second Parthian campaign. To test the prescience of the oracle, Trajan sent to it a blank piece of paper, which was returned to him blank. This gave him a high opinion of its powers, and he consulted it in all seriousness a second time. The response was some dead twigs from a vine, wrapped up in cloth. Trajan's decease some two years afterwards, and the transmission of his bones to Rome, was deemed a sufficient interpretation of the symbolical utterance, and confirmed the celebrity of the oracle. Antoninus Pius (138–161 A.D.) built the great temple, which the legend current among the modern inhabitants counts a work of Solomon. This temple is said to have contained a golden statue of Apollo, or of Zeus, which on certain annual festivals the chief citizens of Heliopolis bore about on their shoulders. When Christianity, under Constantine, became the dominant religion, the temple became a Christian church. In the wars that followed the taking of the city by the Arabs, who sacked it in 748 A.D., the temple was turned into a fortress, the battlements of which are yet visible. The city was completely pillaged by Timur Bey, or Beg, in 1400 A.D. Both city and temple continued to fall more and more into decay under the misery and misrule to which Syria has been subject ever since. Many of the magnificent pillars were overturned by the pashas of Damascus merely for the sake of the iron with which the stones were bound together. What the Arabs, Tatars, and Turks had spared, was destroyed by a terrible earthquake in 1759. B. is now an insignificant village, with a pop. of some

few hundreds. See Wood and Dawkins's *Ruins of Baalbec* (1757); Cassas, *Voyage Pittoresque de la Syrie* (1799); Murray's *Handbook for Travelers in Syria and Palestine;* Baedeker's *Syria and Palestine* (1875).

BA'BA, a Turkish word signifying *father*, originating, like our word *papa*, in the first efforts of children to speak. In Persia and Turkey, it is prefixed as a title of honor to the names of ecclesiastics of distinction, especially of such as devote themselves to an ascetic life; it is often affixed in courtesy, also, to the names of other persons, as Ali-Baba.

BA'BA, CAPE, a bold rocky headland near the western extremity of Anatolia—the Lectum of the Greeks—in lat. 39° 29′ n., long. 26° 4′ e., about 12 m. from the northern extremity of Mitylene, the ancient Lesbos. On a shelving point of the cape stands the town of Baba, with a pop. of about 4000, who do some trade in cutlery of a superior quality. The once large and prosperous, but now utterly ruined city of Assos, mentioned by St. Paul, is in the vicinity.

BABATAG', or BA'BA DAG, a city with 10,000 inhabitants, in the sandjak of Silistria, in the north-eastern part of European Turkey. It is situated in a marshy district; has a high school and five mosques, of which that built by Bajazet I. is the finest. It was Bajazet that founded the city, which he peopled with Tartars, and named after a saint, whose monument, on a hill near by, is resorted to as a place of pilgrimage. Through the port of Kara-Kerman, lying a short way to the s., the inhabitants of B. carry on a considerable commerce with the Black sea.

BAB'BAGE, CHARLES, b. in 1790, entered early at Trinity college, Cambridge, where he took his degree of B.A. in 1814. In 1828, he was elected professor of mathematics in his own university, an office which he filled for 11 years. B. united, in the most happy combination, powers of invention and observation with thorough scientific culture. Among his writings, we notice first his extremely correct and well-arranged *Tables of Logarithms* (Lond. 1834). He was the first to make the method of constructing such tables the object of earnest study. The difficulty of securing accuracy in getting up tables on a large scale, led him to the idea of committing the execution of the work to a machine. Being commissioned by the government to superintend the construction of such a machine, before beginning the work, he visited a great many manufactories and machine establishments, both in Britain and on the continent, in order to become acquainted with all the resources of mechanical art, and thus be in a position to make a combined use of them in his great undertaking. This survey afforded him the necessary information for his able work, *On the Economy of Manufactures and Machinery* (Lond. 1832)—a book which has run through several editions, and been translated into several languages—in which all mechanical processes are classified from the most scientific point of view, and the most interesting examples of the more important kinds of manufacture are described. Besides his *Comparative View of the Different Life-assurance Societies*, his *Differential and Integral Calculus*, his *Decline of Science* (1830), *A Ninth Bridgewater Treatise*, and *The Exposition of* 1851 (1851), B. contributed a number of very ineresting papers to the Transactions of the royal societies of London and Edinburgh.—With regard to B.'s calculating machine, which, from some cause not well explained, was never completed, see CALCULATING MACHINE. He died Oct. 18, 1871.

BABBITT METAL, an alloy containing 4 parts of copper, 24 of best Banca tin, and 8 of antimony. To the melted copper half the tin and the antimony are added gradually, followed by the rest of the tin. The product is a soft metal, much used for reducing friction of axles in heavy machinery, the journals being so made that the babbitting may be readily renewed when worn. It was invented by Isaac Babbitt, 1799–1862, a goldsmith of Taunton, Mass. Congress rewarded him with a gold medal and $20,000.

BABCOCK, RUFUS, D.D., b. Conn., 1798; a graduate of Brown university; Baptist minister, ordained in 1823, and established at Poughkeepsie, N. Y., and afterwards at Salem, Mass.; in 1833, he was president of Waterville college; in 1836, pastor in Philadelphia; again in Poughkeepsie in 1839, and lastly in Paterson, N. J. He has been secretary of the Pennsylvania colonization society, of the American Sunday-school union, and of the American and foreign Bible society; editor of the *Baptist Memorial*, and author of *History of Waterville College*, *Tales of Truth for the Young*, *The Emigrant Mother*, etc.

BA'BEL, TOWER OF. For an account of this building, and the confusion of tongues which it brought about, see the 11th chapter of Genesis. The distinction of being a remnant of the tower of B. has been claimed for three different masses: 1st, for Nimrud's tower at Akkerkuf; 2d, the Mujellibe, 950 yards e. of the Euphrates, and 5 m. above the modern town of Hillah; 3d, the Birs Nimrud, to the w. of that river, and about 6 m. to the s.w. of Hillah—the whole situated in Babylonia (q.v.). The last of these has the majority of opinions in its favor. Every one, it is said, who has seen the Birs Nimrud, feels at once that, of the ruined mounds in this region, there is not one which so nearly corresponds with his previous notions of the tower of Babel. According to Mr. Rich, it is of an oblong form, the total circumference being 762 yards. At the eastern side it is cloven by a deep furrow, and is not more than 50 or 60 ft. high; but on the western side it rises in a conical figure to the elevation of 198 ft.; and on its summit is a solid

pile of brick 37 ft. high by 28 in breadth, diminishing in thickness to the top, which is broken and irregular, and rent by a large fissure extending through a third of its height. It is perforated by small square holes, disposed in rhomboids. The fire-burnt bricks of which it is built have inscriptions on them, and so excellent is the cement, which appears to be lime-mortar, that it is nearly impossible to extract a brick whole. The other parts of the summit of this hill are occupied by immense fragments of brickwork, of no determinate figure, tumbled together, and converted into solid vitrified masses, as if they had undergone the action of the fiercest fire, or had been blown up with gunpowder, the layers of brick being perfectly discernible. These ruins stand on a prodigious mound, the whole of which is itself in ruins, channeled by the weather, and strewed with fragments of black stone, sandstone, and marble. Sir R. K. Porter has shown that the intense vitrifying heat to which the summit has been evidently subjected, must have been the result of fire operating from above, and was probably produced by lightning. This is a curious circumstance, taken in connection with the ancient tradition that the tower of B. was rent and overthrown by fire from heaven. Porter thinks that the works of the Babylonish kings, especially the stupendous temple of Belus, which was erected on the site of the old tower, concealed for a while the marks of the original devastation; and that now the destructions of time and of man have reduced it to nearly the same condition in which it appeared after the confusion. Mr. George Smith discovered the legend of the building of B. among the Assyrian tablets in the British museum, and gave an account of it in his *Chaldean Account of Genesis* (1875).

BAB-EL-MAN'DEB (i.e. "the Gate of Tears") is the name of the strait between Arabia and the continent of Africa, by which the Red sea is connected with the gulf of Aden and the Indian ocean, so called from the danger arising to small vessels from strong currents. The Arabian peninsula here throws out a cape, bearing the same name as the strait, rising to the height of 865 ft. About 20 m. distant from this cape stands the wall-like coast of Africa, rising in Ras Sejan to the height of 380 ft. Within the straits, but nearer to Arabia, lies the bare rocky island of Perim (q. v.), now occupied by the English as a fort; the strait on the e. side of this island is called the little strait, and that on the w. the great strait. The depth of the former varies from 8 to 12 fathoms; that of the latter reaches 185 fathoms. The first is usually chosen by vessels on account of its affording good anchorage. Close to the African coast lie eight small islands, called the Eight Brothers.

BA'BER, or BA'BUR (Zohir-Eddin Mohammed), the first of the Great Moguls in India, a descendant of Timur, was b. in 1483. He was barely 12 years of age when he succeeded his father, Omar Sheikh Mirza, in the sovereignty of the countries lying between Samarcand and the Indus. With a view to the conquest of India, although constantly contending with revolts in his own dominions, he made himself master, by fraud and force, of the provinces of Kashgar, Kundez, Kandahar, and Cabul. Having thus opened the way to India, he made two or three rapid incursions into Hindustan; and finally taking advantage of the feeble government of Ibrahim Lodi, about the end of 1525, he crossed the Attock (the Cabul branch of the Indus), quickly defeated some bodies of troops that opposed him in the Punjab; and at last, in April, 1526, on the plain of Panipat, not far from Delhi, encountered and fought a decisive battle with his enemy, whose army was far superior in numbers. The 100,000 men and 1000 elephants of sultan Ibrahim were dispersed; Ibrahim himself fled; and B. made his entry into Delhi. In the following month, Agra, the second city of the empire, surrendered. B.'s enjoyment of empire in India was short; he died in 1530, having had to contend during the five years of his reign with numerous conspiracies and revolts. To the talents of a general and statesman, which he manifested in his conquests, his improvements of public roads, measuring of lands, adjustment of taxation, postal arrangements, etc., B. united a taste for science and art. He wrote, in the Tartar language, the history of his own life and conquests, which was translated into Persian by Abdul Rachim, and, more recently, from the Persian into English. B. was succeeded on the throne of Delhi by the eldest of his four sons, Humayun, and was the founder of the B. or Great Mogul dynasty.

BABEUF, FRANÇOIS NOEL, generally known by the name of "Caius Gracchus," which he affixed to his political articles, was b. in 1764 at St. Quentin, in the department of Aisne, France. On the breaking out of the revolution in 1789, he became a fanatical advocate of the popular demands. During the reign of terror he took up a position of hostility to Robespierre and the terrorists. In his journal, established at Paris, in July, 1794, and termed *The Tribune of the People,* he preached the sovereignty of the masses, and defended the absurdest consequences flowing from that political doctrine. He was in favor of a new distribution of the land, of the abolition of every political order, and the equality of all individuals, wise and foolish. His violent language caused him to be imprisoned. On his release, he attached himself to the members of the extreme Jacobin party, which had just been overthrown. A secret conspiracy was formed, the aim of which was the destruction of the directory, and the complete re-establishment of the democratic constitution of 1793, which had been suspended during the reign of terror. The plot was discovered through the treachery of one of the members. B. and other chiefs were seized, imprisoned, and ultimately brought to trial. B. defended himself with the courage of a fanatic, and overwhelmed his judges with abuse. He was of

course condemned to death, and was guillotined on the following day, May 24, 1797. B. was a weak-headed enthusiast, without talent or culture; but abler men in the conspiracy made use of his furiously resolute character to secure the ends they had in view.

BABINGTON, ANTONY, an English gentleman of the county of Derby, head of a conspiracy in favor of Mary Stuart of Scotland. The rivalry between queen Mary and queen Elizabeth of England was at the same time a contest between Catholicism and Protestantism. Accordingly, the various plots for rescuing Mary from the power of her enemy were of the same character, and have been misrepresented and judged of according to the ecclesiastical prejudices of each historian. B., young, rich, a zealous Catholic, and on that account already an enthusiastic admirer of the unfortunate Mary, was induced, through the agents of a determined conspirator, Morgan, who had been arrested in France at the instance of the English court, to put himself at the head of a plot that had for its object the murder of queen Elizabeth, and the rescue of Mary. The execution of the murder was undertaken by one Savage, in which he was to be assisted by a number of the Catholic nobility, as circumstances might require. The day of action was fixed for the 24th of Aug., 1586. B. reserved the deliverance of Mary for his own share, entered into correspondence with her, and received letters purporting to be from her in return, approving of the assassination of Elizabeth. The secretary, Walsingham, not only had all the threads of the plot in his hand, but contributed, through his emissaries, to spur on the conspirators to the execution of their plans. When the right moment was come, B. and his accomplices were arrested, and condemned. B. made no denial, acknowledged the letters to Mary to be his, and, Sep. 20, 1586, laid his head on the block. Savage, Barnwell, Bollard, Abington, Tichburne, and Tilnec, had a like fate. Mary Stuart herself had, four months later, to ascend the bloody scaffold; and her condemnation was justified chiefly on the ground of those letters received by Babington. Mary, however, denied to the last moment that the letters were written by her hand, or with her knowledge; and her friends constantly maintained that they were the work of Walsingham himself, in order that the unhappy queen might be got rid of with a show of justice. The rest of Walsingham's conduct in this affair, as well as the way in which he was in the habit of supporting Elizabeth's views in general, give at least a high degree of probability to the accusation.

BABINGTON, CHURCHILL, b. England, 1821; professor of archæology; has written on botany, ornithology, numismatics, archæology, etc., and edited the orations of Hyperides from recently discovered manuscripts.

BABISM (from BÂBI, or BÂBY); the appellation of a sect in Persia, founded by Seyd Mohammed Ali, b. about 1824, who assumed the name of "Bâb," i.e. "the gate." On returning from a pilgrimage to Mecca in 1843, Seyd appeared in his native city (Shiraz) with a new commentary on the Koran, and soon became engaged in controversy with the regular priests, who, exasperated by his free criticism of their conduct, obtained an order forbidding him to teach in public and confining him to his house. Here he taught privately, increasing his pretensions, and declared that he was Nokteh, "the point;" not merely the recipient of a new divine revelation, but the focus in which all preceding dispensations would converge. He gained proselytes rapidly, among them a woman—a wonderful circumstance in any country of the east—known as Gourred-Oul-Ayn ("Consolation of the Eyes,") because of her surpassing loveliness. The new religion made rapid progress, and the efforts of the authorities to suppress it produced civil war. Hussier, one of Seyd's disciples, was taken, after defeating several expeditions sent against him, and put to death in 1849; and the next year Balfouroushi, another leader, was slain in battle. The Bâb himself was imprisoned and executed, but his death did not discourage his followers. They recognized Mirza Yahya, a youth of noble descent, as his successor, who established himself in Bagdad, where he is now, or was not long ago, living. An attempt in 1852 of some zealous Bâbis to assassinate the Shah led to a terrible persecution, in which the beautiful "Consolation of the Eyes" perished. The Bâb doctrines are essentially a system of pantheism, with additions from gnostic and other sources. All individual existence is regarded as emanating from the superior deity, by whom it will ultimately be reabsorbed. Great importance is attached to the number 7, as indicating the attributes supposed to be displayed in the act of creation; and to the number 19, which mystically expresses the name of the Deity himself, and is, moreover, the sum of the prophets among whom the latest incarnation of the divine nature is conceived to be distributed in the present dispensation. The sacred college cannot become extinct until the final judgment, the death of any of its members being immediately followed by a re-incarnation, as in the case of the grand lama. Moses, Christ, and Mohammed are considered to be prophets, but merely precursors of the Bâb. The morals of the sect are good; polygamy and concubinage are forbidden; the veiling of woman's face is omitted, and the equality of the sex is so far recognized that at least one of the 19 prophets must always be a female. Asceticism is discountenanced, mendicancy prohibited, and hospitality, charity, generous living, and abstinence from intoxicating liquors and drugs, are taught and practiced.

BA'BOO, a title of respect equal to "Mr." in English, given in India to educated and wealthy natives noted for liberal views, public spirit, and generosity.

BABOON, *Cynocephalus*, a genus of the monkey family, or *simiadæ* (see MONKEY), and distinguished from all the rest of that family by the very elongated muzzle, which terminates abruptly, and is pierced with nostrils at the end like that of a dog. The face has, indeed, a general resemblance to the face of a dog. The dentition agrees with that of the other apes or monkeys of the old world, to which the baboons are entirely confined, being only distinguished by the remarkable strength of the canine teeth. Baboons, like almost all the monkey family in the old world, have callosities upon the buttocks; and, like the greater part of them, they have cheek-pouches. The tail of some of the species is of considerable length, that of others is a mere tubercle, with an erect tuft of hairs. The physiognomy of all baboons is repulsive, and indicates the fierceness which strongly characterizes them, and in which they differ from monkeys in general; some of the larger ones are dreaded by the inhabitants of the country in which they are found; the danger to be apprehended from them being increased by the numbers in which they usually herd together. Their fore and hind legs are so proportioned, that they walk easily, and run swiftly on the ground; but, like all other quadrumanous animals, they climb trees and rocks with great agility. Their hair is long, forming a sort of mane on the upper parts. All of them are very susceptible of cold, and they seldom live long when removed from their native tropical countries. They feed chiefly on fruits and roots: some of them inhabit barren and stony places where scorpions abound, which they seize, adroitly deprive of the sting, and devour. They are very cunning, mischievous, and revengeful; troops of them sometimes enter a plantation, not merely to plunder, but apparently to amuse themselves by destroying whatever they can find; they seem, however, always to have some appointed to keep watch, and they make off with great rapidity on the first signal of alarm. When plundering, they cram their cheek-pouches before they begin to eat. These cheek-pouches are very capacious: a B., kept in confinement, has been seen to put eight eggs into them at once, and then to take out the eggs one by one, to break them at the end, and deliberately to suck their contents. The larger baboons are sometimes hunted by dogs where they have not trees to take refuge in; but a single dog, however powerful, cannot safely attack them; a B. will seize a dog by the hind legs, and whirl him round and round till he is stupefied. Baboons are not so easily domesticated as many kinds of monkey; however, they are not quite incapable of it when taken young. "Happy Jerry," a mandrill or rib-nose B., which was long a great object of attraction at Exeter Change, used to sit with great gravity in an arm-chair, awaiting orders, which he obeyed with slowness and composure. He smoked tobacco, but did not seem much to relish it, and was rather induced to do it by a bribe of gin and water, for which his fondness was unquestionable.

As examples of baboons with tails of considerable length, may be mentioned the chacma, or pig faced B., also called the ursine B. (*C. porcarius*), a native of s. Africa; and the dog-faced B. (*C. hamadryas*), a native of Arabia, Persia, and the mountains of Abyssinia. The latter species, perhaps the only one known to the ancients, is often sculptured on the ancient monuments of Egypt, and it is supposed to have been the species of monkey to which divine honors were paid. Its body was frequently embalmed, and B. mummies are still found.—The chacma is one of the largest of the baboons, about the size of an English mastiff, and very much stronger; it is common on the mountains of Cape Colony, and in troops would be very formidable, but that they usually scamper out of the way, instead of attacking travelers, unless they are provoked. It is of a dark-brown color, with long shaggy hair. The tail is rather more than half the length of the body, and is terminated by a tuft of long black hair.

The short-tailed, or almost tailless baboons, far exceed their longer-tailed congeners in ugliness. Only two species are certainly known—the mandrill or rib-nose B. (*C. mormon*), and the drill (*C. leucophæus*), both natives of Guinea. The mandrill is the largest, fiercest, and most powerful of the whole genus. The colors of its fur are very fine, of a light olive brown above, and silvery gray beneath; but besides other things unpleasant to the sight, its face is peculiarly hideous; the cheek-bones in the adult males being enormously swollen, so that the cheeks are protuberant to the size of a man's fist upon each side, and ribbed with blue, scarlet, and purple. In their native forests, mandrills generally live in large troops, and are said to put to flight every other wild beast.

BA'BRIUS, a Greek fabulist, who lived about the close of the Alexandrian age, or the beginning of the succeeding Roman-sophistic period, made a considerable collection of Æsopian fables (see ÆSOP), which he turned into verse, in a natural and popular style. Several versions and transformations of these were made during the middle ages, and have come down to us under the name of *Æsop's Fables*. Bentley, who, in his *Dissertatio de Babrio* was the first to recognize in these fables of Æsop the original work of B., endeavored to restore portions of the verses, and pointed out other fragment of the genuine B. in other quarters. A few fables were added from manuscripts by Furia, Korais, and Schneider, and all that was known at the time was collected by Knoche (Halle, 1835). At last, in 1842, a Greek of the name of Minoides Minas, employed by the French government to explore the convents of the east, discovered a manuscript with 123 hitherto unknown fables of B., a copy of which he made and brought to Paris, where they were published in 1844. The best edition is that by Lachmann (Berl. 1845).

BABUYANES ISLANDS, in the Pacific between the Loo Choo islands and Formosa; Calayan and Babuyan are the most important. They are fertile, and furnish a large quantity of sulphur. Batan is the largest town. Pop. of the islands est. 8,000.

BABYLON—BABYLONIA. Babylonia was the name given in ancient times to the flat country about the lower course of the Euphrates, called in modern times Irak-Arabi. In the Old Testament, it is call Shinar, Babel, and also "land of the Chaldees;" and by the later Greek and Roman writers, occasionally Chaldea. Its proper boundaries were: on the n., towards Mesopotamia. the Euphrates and the Median Wall, which extended from the junction of the Chabur with the Euphrates to the Tigris; on the e., towards Assyria and Susiana, the Tigris; on the s., the gulf of Persia; and on the w., the desert of Arabia. During the wider extension of the Babylonian dominion, the name comprehended also Assyria and Mesopotamia. The country forms a perfect plain, which is a continuation of that of Assyria. The two rivers, Euphrates and Tigris, here approach each other most nearly, until their blended waters fall into the Persian gulf. The country was once protected from flooding by numerous canals and embankments, and several artificial lakes, which are now mostly in ruin. The most important canal was that now known as Nahr-el-Melik, which is undoubtedly the ancient royal canal that joined the two great rivers. It was kept in repair by the Roman emperors, and was serviceable as late as the 7th century. The soil, naturally fertile, was rendered more so by the garden-like way in which it was cultivated, and yielded abundant crops, especially of wheat, barley, and dates. The want of stone and wood was more severely felt than in Assyria. The only building material was brick, for which the soil afforded abundance of clay. The bricks were either dried in the sun or burnt, and were very durable, resisting, in the ruins, the effects of the weather to this day. Mineral bitumen, springing up everywhere in abundance, served as mortar. In this favored plain, the human race attained early a state of social and political organization, the oldest, indeed, that antiquity gives us any account of.

Until recently, the early history of Babylonia was doubtful and dark. The only sources were a few incidental notices in the Bible; some fragments derived at third hand from the perished writings of Berosus, a Babylonian priest, who had translated the annals of his country into Greek; and lastly, the notices of Greek writers, chiefly Herodotus. But the whole is confused and contradictory, and history and mythology were jumbled together.

But light is now breaking in upon the darkness. In recent years, multitudes of brick tablets, stamped with cuneiform (see CUNEIFORM) characters, have been dug up from the ruins of the great cities that once studded the banks of the Tigris and Euphrates; and in these we find ourselves in possession of contemporaneous records of events reaching back 30 c. before the Christian era, and restoring a page of human history that was apparently lost.

At the earliest period to which the records carry us back, the population of the whole valley of the Tigris and Euphrates consisted mainly of tribes of Turanian origin, their language having remarkable affinities with those of the Ural-Altaic group of the Turanian nations, e.g. the Finns, the Magyars, and Turks. Closely allied tribes occupied the whole region s.w. of the Caspian sea—Media, Armenia, Elam, Susiana. In that region lies Ararat, the "Mountain of the World," and to that region the traditions of those Turanians pointed as the cradle of their race. But the earliest records reveal the existence of a Semitic element in the population of the Euphrates valley, coming in apparently from the s.w.—Arabia and Egypt. The infiltration of this foreign element went on increasing for centuries, until at last it got the upper hand, and the Babylonians and Assyrians, when they became known to the historians of the west, were essentially Semitic peoples. Their civilization, however, was merely a development of what they took up from the original inhabitants.

The dominant people in Babylonia in the earliest times were the Accad, or Accadians. They had come originally from the mountains of Elam, to the e. of the Tigris, and hence their name Accad, which means "highlanders." They brought with them the art of cuneiform writing, as well as other arts and sciences, especially astronomy. It is in the Turanian language of these Accadians that the cuneiform inscriptions of Babylonia are written for many centuries. And when the Semitic tongue had become predominant, Accadian, now a dead language, was to the Assyrians what Latin has been to the nations of modern Europe: Assyrian scholars translated the Accadian literature into their own language, and their technical and sacred terms were borrowed from it. Every day is bringing to light new proofs of the influence of these Accadians upon the civilization of the Semitic nations, and through them upon that of Europe. Greece, it is well known, derived its system of weights and measures from the Babylonian standards; but these have been proved to be of Accadian origin. The Greek *mina* or *mna*, the fundamental unit of the Greek monetary system, is the *maneh* of Carchemish, and *maneh* is found to be not a Semitic but an Accadian word, showing the origin of the system. The sexagesimal division of the circle; the signs of the zodiac; a week of seven days, named as we now name them, and the seventh a day of rest, are all Accadian. Every large city had its public library. In the royal library of a Babylonian monarch, Sargon (about 2000 B.C.), every tablet was numbered, so that the reader had only to write

down the number of the tablet he wanted, and it was handed to him by the librarian. Among the multifarious subjects of this extensive literature there are hymns to the gods strikingly like the Hebrew psalms; and in a long mythological poem there is an episode giving an account of the deluge almost identical with that of Genesis, only more detailed. See ASSYRIA. The Accad religion was originally a Shamanism (q.v.), similar to what still prevails among the Turanian tribes of Siberia; but it gradually developed into a huge system of polytheism, which was adopted and modified by the Semitic inhabitants. The Accadians were great in magic, and the Greek *magos*, a magician, is derived from an Accadian word equivalent to "reverend."

The city of Babylon was not the first seat of power. The earliest records yet discovered are those of a monarch whose capital was Ur (now Mugheir). Art was already far advanced, and the extent of the monarch's resources is seen in the ruins of the temple of the sun-god built by him; it is calculated that 30,000,000 bricks must have been used in its construction. Centuries, apparently, after this, a fresh invasion from Elam is recorded, to which the exact date can be assigned of 2280 B.C. Another Elamite conqueror, named Cudur-mabug, extended his sovereignty over Palestine, and it is inferred that a sovereign of this dynasty is the Chedorlaomer of Genesis (the name in Accad would be *Kudurlagameri*, "worshiper of the god Lagamaru"). Some time after this, the seat of power was finally fixed at Babylon, and the Semitic tongue now began to supersede the Accadian.

The cities in the northern division of the country had been founded by colonists from the s., and were long ruled as dependencies of Babylonia. At length they grew into the independent kingdom of Assyria; and in the 14th c. B.C. an Assyrian monarch captured Babylon. From that time the position of the southern state becomes more and more subordinate to the northern, and finally sinks into a province. Babylonia, however, was not always a submissive vassal. Under the leadership of Chaldean chiefs, it made many struggles for independence. The Chaldeans are first heard of in the ninth c. before Christ as a small Accadian tribe on the Persian gulf; but they became so prominent in these struggles that they latterly gave their name to the whole province of Babylonia, which came to be styled Chaldea. The name of one of those Chaldean chiefs, Merodach-Baladan, occurs both in scripture and in the inscriptions. From the former, we know that this king sent a message to Hezekiah, king of Judah, ostensibly to inquire about his recovery, probably with a view to an alliance against Assyria; and from the latter, that Merodach was expelled by Sargon, king of Assyria, that he made a fresh attempt to recover his throne, and was finally dethroned by Sennacherib. The complete subjection of B. to Assyria at this time (680 B.C.) is proved also from the scripture account, which states that Esarhaddon, son of Sennacherib, reigned in Babylon. About fifty years afterwards, Nabopolassar, governor of B. for the Assyrian king, proved faithless to his trust, and entered into an alliance with the Median king, Cyaxares, for the overthrow of the ruling state. See ASSYRIA. This undertaking was successful, and B. now (625 B.C.) became, though it was but for a short time, an independent and conquering power. The son of Nabopolassar, Nebuchadnezzar II., next defeated the Egyptian king, Necho, at Circesium (Karchemish), on the Euphrates (604 B.C.), and thus annihilated the Egyptian dominion in Asia. He then subdued Jehoiakim, king of Judah; and in consequence of repeated revolts, destroyed Jerusalem, and put an end to the kingdom of Judah under Zedekiah (588 B.C.), carrying the inhabitants captive to Babylon. The Phenicians submitted to him voluntarily, with the exception of Tyre, which underwent an obstinate siege without yielding. After a fortunate expedition against Egypt, Nebuchadnezzar turned his attention to the adornment of his capital; and the greater part at least of those buildings usually ascribed to a very early period, and especially to the mythical Semiramis, belong to him. After his death (562 B.C), the Neo-Babylonian empire fell to pieces as suddenly as it had sprung up, and under Nabonedus (Nabunita, in the cuneiform inscriptions, and in Herodotus, Labynetos), who had entered into an alliance with Crœsus of Lydia, against Persia, it came under the dominion of Cyrus (529 B.C.). The Belshazzar of scripture is thought to be the son of Labynetos, to whom was confided the defense of B., while the elder prince held Borsippa. From this time B. appears on the Persian monuments as a Persian satrapy, under the name of Babirus.

With the overthrow of the Persian monarchy, B. came under the short lived dominion of Alexander the Great, who died in that city (323 B.C.). Seleucus I., to whom it had been promised at the conference of Triparadisus, contested and won the possession of it from Antigonus (312 B.C.). About 140 B.C., it was taken from the Syrian monarchs by the Parthians. It came into the hands of the Romans only temporarily, first under Trajan (114 A.D.), under Septimius Severus (199 A.D.), and again, under Julian (363 A.D.). When, in 650, the successors of Mohammed put an end to the new Persian monarchy of the Sassanides, the province of B., where Bagdad was built (762–766), became the seat of the califs till 1258. Since 1638, when the Turks, for the second time, took it from the Persians, it has been under the dominion of Turkey, divided into the pashalics of Bagdad and Basra.

The classic writers represent the civilization of the ancient Babylonians as of a high stamp. The government was despotic, of a kind to suit a crowded, luxurious, and effeminate population. Arts and commerce were highly flourishing—the last was

carried on by caravans with Bactria, Persia, and Media, perhaps as far as India, and by shipping on the Persian gulf with Arabia. B. was famous for its dyes, its cloths, and embroideries, especially for the manufacture of rich carpets with inwoven figures of strange animals and arabesques, such as we yet see on the Nineveh sculptures. The general prosperity was such, that B. and Assyria together were able to pay to Persia, in the time of Darius Hystaspes, a yearly tribute of 1000 talents (upwards of £280,000)—a sum greater than that contributed by any other province.

The Babylonians were notorious for their effeminacy, luxury, and licentiousness. Their religion was nearly allied to that of the Phenicians. The essential part of it was the worship of the powers of nature, as they are manifested in the larger heavenly bodies and in the fertility of the earth. At the head of their system of belief stood Baal (see Baal), reverenced through the whole of Mesopotamia and Canaan, who represented, in a general way, the power of nature, without having any moral significance, and was specially identified with the sun. Along with him stood, as feminine complement, the goddess Baaltis, the receptive earth, with whose worship all manner of licentious rites were associated. She makes her appearance principally as Melyta or Mylitta—i.e., "the causer of generation." How nearly she is related to Ashtaroth (among the Greeks, Astarte), whose functions are so similar, it is not easy to determine. Education and religion were in the hands of the caste of the Chaldees, who occupied themselves at the same time with astronomy and astrology, and kept records, from the earliest times, of their astronomical observations, associating with them the chronicles of their kings. Their scientific acquirements must have been considerable. Engraved cylinders and gems, and the remains of their pottery, testify to their progress in these departments of art; and their architecture, according to the testimony of the ancients and the ruins still remaining, deserves to be ranked high.

Apart from canals, bridges, embankments, and sluices, the interest on the subject of Babylonian architecture is concentrated in the ruins of the capital, Babylon. The accounts that we find in the ancients of the origin, the greatness, and the structure of the city, are exceedingly confused. The god Belus is named as its founder, and also queen Semiramis; how we are to understand the two statements is not explained. Semiramis, according to the account of Diodorus, employed on it two millions of work men, collected from all parts of her dominions. With the capital of the older kingdom, the accounts of the ancients known to us have, for the most part, nothing to do; they are all to be referred to the resuscitated and adorned residence of Nebuchadnezzar. Herodotus gives a description of the city, apparently from his own observation. It stood on both sides of the river, in the form of a square, the length of whose sides is variously given; by Herodotus it is stated at 120 stadia, making the whole circumference 60 miles. It must be remembered, however, that the walls, like those of most oriental towns, inclosed rather populous districts than cities, so that the whole mass of the population might easily find shelter within the space inclosed. It was surrounded by a wall 200 cubits high, and 50 cubits thick, and furnished with 100 brazen gates—the last number is raised by Diodorus to 250. The city was built with extreme regularity, with broad straight streets crossing one another at right angles; and the two parts were connected by a roofed bridge built of hewn stones, fastened together with iron clamps. Of this bridge, not a trace has yet been discovered. The western part of the city is undoubtedly the older, belonging to the early and properly Babylonish dynasty. Here stood, in the middle of the city, as it is described, the famous temple of Belus or Baal, called by the Arabs, Birs Nimrud. See Babel, Tower of. The next important point on the w. side is the mass of ruins called Mujellibe, which was probably the royal citadel of the old Babylonian monarchy. On the e. side of the river stood the buildings of the Neo-Babylonian period, among which the "Hanging Gardens" of Semiramis are to be singled out as one of the wonders of the world. Of these gardens, Diodorus has left us a detailed description. Their ruins may be recognized in the mound called El-Kasr. The city suffered greatly from the Persian conquest. When it revolted under Darius I., and, after a siege of two years, was recaptured through the ingenuity of Zopyrus, the outer walls were demolished. Xerxes plundered the temple of Belus, which had been hitherto spared, and Herodotus found it empty. Although the Persian kings made B. their residence, nothing was done for the restoration of the city; and Alexander the great, who, on his entrance, in 331 B.C., had promised the inhabitants to rebuild the ruined temple, was unable even to clear away the rubbish, although he employed 10,000 workmen for two months. After his death in the palace of Nebuchadnezzar, and the foundation of Seleucia on the Tigris by Seleucus Nicator, B. went rapidly to decay. This was partly owing to the new city's being built of the materials of the old, and partly to the want of durable materials for monumental buildings. Stones of any size had to be brought from the mountains of Armenia; their place was mostly supplied by burned brick. As early as the time of Pausanius, there was little to be seen but the ruins of the walls. The older Arabian geographers know, indeed, of a village, Bâbil, but speak more of the great masses of ruins. Since the time of Della Valle, who erroneously looked upon the ruin Mujellibe as the tower of Belus (in which he is followed by Rennel), the site of B. has been the object of many travels and researches. The greater number of the explorers, among whom Rich is the most distinguished, consider the town of Hillah, with 7000 inhabitants, as the representative of the ancient

Babylon. The great masses of ruins, from which we must not, with Rennel, exclude the Birs Nimrúd, embrace, indeed, an enormous extent, but agree perfectly with the accounts of the ancients in being arranged in the form of a square. Some time ago, Rawlinson transferred the site of B. to Niffer; but before anything can be determined, researches must be made on the spot, which could hardly fail to lead at the same time to valuable results, like those of Botta and Layard in Assyria, and increase the collection of cuneiform inscriptions, which are yet only fragmentary. See Rich's *Memoirs on the Ruins of Babylon*, and his *Personal Narrative of a Journey to England by Bussorah, Bagdad, the Ruins of Babylon;* Rawlinson's *Five Great Monarchies;* Layard's *Nineveh and Babylon;* Lenormant's *Langue Primitive de la Chaldée; Transactions of the Society of Biblical Archæology;* Smith's *Assyrian Discoveries;* Sayce's *Babylonia*, in the *Encyclopædia Britannica.*

BABYLONISH CAPTIVITY. In the despotic policy of the east in ancient times, it was a rule to remove the rich and leading inhabitants of a conquered province to a distant part of the empire, where they were separated by nationality, language, customs, and religion from the great body of the population, and thus rendered politically harmless; while the people that remained behind were by this means deprived of influential leaders. The inhabitants of Judea underwent oftener than once a deportation of this kind, after they came into conflict with the powerful kingdom of Assyria. Thus, the kingdom of Israel was put an end to under king Hosea (722 B.C.), by the Assyrian monarch Shalmaneser, who, after taking the capital, Samaria, carried the principal inhabitants into captivity in Assyria, and brought stranger tribes into the land of Israel in their stead; these, with the Israelites that remained, formed afterwards the mixed nation of the Samaritans. The most remarkable exile, however, befell the tribe of Judah under Nebuchadnezzar. Zedekiah, king of Judah, warned in vain by the prophet Jeremiah, allied himself with the king of Egypt against the sovereignty of Babylon. Nebuchadnezzar soon appeared with a powerful army before Jerusalem, which he took (588 B.C.). King Zedekiah had his eyes put out, and he and the principal part of the inhabitants were carried captive to Babylon. It is this captivity, the duration of which is usually reckoned at 70 years, although, strictly speaking, it lasted only 56 years, that is called, by way of distinction, "the Babylonish captivity." The situation of the exiles was in other respects tolerable. Most of them settled down, and acquired property, and even riches; many were called to court, and even raised to high offices in the state. They were allowed to retain their organization by families, and lived by themselves essentially according to the Mosaic law. They had also their own chief, and were allowed the free exercise of their religion. Nor did they want consolation and encouragement; for Ezekiel raised among them his powerful prophetic voice, and the idea of the Messiah became more clearly developed. When Cyrus overthrew the Babylonian empire (538 B.C.), he allowed the Jews to return to their own country. Only the tribes of Judah, Benjamin, and Levi availed themselves of this permission: the other ten tribes disappear from history after the captivity. It is probable that they had become so mingled with the Babylonians, a people of kindred origin, that they had ceased to remember the country of their race. Vain attempts have, in recent times, been made to discover the ten lost tribes. Some learned men have sought for them in China and India, while others have declared the Afghans to be their descendants, and even the North American Indians. A more probable conjecture, perhaps, is that they were the ancestors of the Nestorians in the mountains of Kurdistan.

BABYLONISH CAPTIVITY (*ante*), the carrying into captivity of 200,000 people of Jewish cities, about 713 B.C., by the officers of the king of Assyria. Before this, however, there was the "Assyrian captivity," the result of the invasion of the kingdom of Israel by three or more successive Assyrian kings. About 762 B.C., Pul imposed a tribute upon Menahem. About 738 B.C., Tiglath-Pileser carried away in large part the trans-Jordanic tribes and the inhabitants of Galilee. Shalmaneser made two invasions, and, in 720, after a siege of three years, took Samaria and carried many Israelites away as captives, populating Samaria by Babylonians and other foreigners. It is supposed that Tiglath-Pileser took the Israelites away to people his great city. His successor, Shalmaneser, made Hoshea, the king of Israel, a tributary, and when the tribute was not paid he took Samaria by way of punishment, and carried to Assyria the king and all the most desirable remaining population of the ten tribes. These were settled in distant cities, and their places were supplied by colonies from Babylon and Susis. As captives, the people were treated with no especial harshness. They were not bondmen, as one might suppose from the term "captive;" but even in Babylon their elders retained the power of life and death over their own people; and at a later period the Jews in the principal cities were governed by an officer of their own nation, as was the case in Egypt under the Ptolemies. The Jews in Assyria themselves held slaves; the book of "Daniel" tells of a Jew in high political station, and in "Esther" we find their power and consequence in the Persian empire celebrated. Doubtless their lot was more comfortable than that of other conquered nations among whom they dwelt. Much effort has been made to discover the ultimate condition or fate of the ten tribes. Josephus in his day thought that they dwelt in large communities somewhere beyond the Euphrates. Rabbinical tradition makes the same assertion, with many imaginative exemplifications. Christian

writers have traced them all over the world. Some find them among the Afghans; some tell of a Jewish colony at the foot of the Himalayas; the "Black Jews" of Malabar claim an affinity or descent from them; they have been supposed to be fathers of the Tartars, of the Nestorians, of the North American Indians, and by some recent scholars of the Anglo-Saxons. The best that can be done, in the light of established history, is to trace their footsteps in four directions. After the captivity, some returned and mixed with the Jews; some assimilated with the Samaritans and became enemies of the Jews; many remained in Syria, mixing there with other populations, and forming colonies throughout the east; but most of them probably apostatized in Assyria, adopting the idolatry of the nation around them, and were finally merged into the stronger and more numerous people.

The second, or "Babylonian captivity," consists of two distinct deportations. Nebuchadnezzar made several invasions of Judea, and finally destroyed Jerusalem and the temple, and carried the people to Babylon. The first principal deportation was in 598 B.C., when Jehoiachim, and all the nobles, soldiers, and artificers were carried away; the second great deportation followed the destruction of the temple and the capture of Zedekiah, 588 B.C. Although the number of persons carried away is in several instances set down, it is not probable that such numbers represent the whole deportation, for the sum total on record can be but a mere fraction of the Jewish people. The captives were treated not as slaves, but as colonists. There was nothing to hinder a Jew from rising to the highest eminence in the state or holding the most confidential office near the throne. They had no temple and offered no sacrifices; but the rite of circumcision was observed, and their genealogical tallies were kept so that they were usually able to tell who was the rightful heir to the throne of David. The first great event in the *restoration of the Jews* was the decree of Cyrus, 536 B.C., under which 42,360, with 7537 slaves and cattle and personal goods, left Babylon under Sheshbazzar. They laid the foundation of the second temple 53 years after the destruction of the first. The work was stopped almost immediately. But under Darius the Jews found favor, and under the guidance of Ezra, Nehemiah, and others Jerusalem was to some extent restored, and exiled families doubtless returned and occupied the country round about. Nevertheless, the great mass of the Jewish people remained in the countries over which they had been scattered. Before the captivity, many Jews had settled in Egypt; others in Sheba. Among those who returned to Judea, about 30,000 are said to have been of the tribes of Judah, Benjamin, and Levi. Recent students conclude that about six times as many Jews preferred to remain in Assyria, where they kept up the national distinction, and were known to their brethren as "the dispersion," that is, Jewish people residing beyond the limits of Palestine. This dispersion was in three directions or countries: in Babylonia, in Egypt, and in Syria. A still later and more perfect "captivity" was that suffered by the people of Palestine under the Romans, when, after the massacre of untold myriads of their people, the Jews were reduced to abject bondage. Josephus says that 1,100,000 people were slain in the siege of Jerusalem by Titus, and 97,000 were captured and distributed among the Roman provinces, butchered in amphitheaters, thrown to wild beasts, or sold to slavery in Egypt. Doubt is cast by some writers on the numbers given by Josephus. The last stand of the Jews for national existence was about 133 A.D., when the struggle resulted in the practical extirpation of the people from their chosen land; and since that event—the rebellion of Bar-chobab—the descendants of Abraham have been unable to present, anywhere on the earth, even the semblance of an organized nation.

BABYROUSSA, *sus babyroussa*, a species of hog (q.v.) inhabiting the forests of Java and the Molucca islands, remarkable for the extraordinary tusks of the upper jaw, which rise like horns through the bone and integument, are long, somewhat slender, and curved backwards; their use being probably similar to that of horns. The animal is sometimes called the horned hog. Its limbs are much more slender than those of the common hog.

BACCHANA'LIA, or DIONYSIA, festivals in honor of Bacchus. Four were held at Athens. One was in Dec., after the vintage was over, when a nude and indecent procession was had, slaves were given brief liberty, and general drunkenness prevailed. One was in Jan., after the new wine had been pressed out, when the state bore the cost of a public banquet, a procession, and a dramatic entertainment. In Feb. came the flower festival, lasting three days; on the first the new wine was tasted, and candidates were initiated into the mysteries of Bacchus; on the second there were public games; on the third flowers were offered to Dionysius, presents were made between friends, and slaves were free for the time. The fourth, or great festival, came in Mar., and attracted strangers from all parts of the country. It was conducted by the chief archon, and paid for by the state. It included the giving of a prize for the best drama, a banquet, a procession, and theatrical performances. Like all others, this festival was a season of riotous and drunken indulgence. Bacchus was represented, accompanied by women frenzied with drink or excitement, carrying cymbals, dancing, and singing songs in honor of the god: and with them were men disguised as wild beasts, fauns, and satyrs. In Rome the excesses became so gross that the state forbade such celebrations altogether.

BACCHAN'TES, women who took part in the secret Bacchic festivals; also males, when they were admitted. In the old universities a student in his first year was a B., and was made to pay for the drinks of his elders, and otherwise abused. There was also an order of B. whose members were idle or dissipated students, getting more of their living by begging and theft than by honest occupation. Modern "hazing" may be a reminiscence of the mediæval Bacchantes.

BACCHIGLIO'NE, a river of northern Italy, having its source in the Alps, and its outlet in the Adriatic. It passes through the town of Vicenza, where it is crossed by a fine bridge of nine arches; flows through the plain of Padua, and enters the Adriatic about 3 m. s. of Chioggia. Its whole course is about 90 m., and it is navigable by large boats from Vicenza to the sea.

BACCHUS, the god of wine (called in Greek, Bakchos, Dionysos, and also, especially in the mysteries, Iakchos), was the son of Zeus and Semele, the daughter of Cadmus. Before his birth, Semele fell a victim to the insidious counsels of the jealous Here, who induced her to petition Zeus to visit her in his proper form and majesty—i.e., attended with thunder and lightning. The mother was of course consumed, but the six-months-old B. was saved by being inclosed for some time in the thigh of Zeus. He was first consigned to the care of Ino, the sister of Semele, and her husband Athamas; but when Ino and Athamas were driven mad by Here, Zeus caused him to be carried to Nysa, in Thrace, and given in charge to the nymphs. It was here that B. taught the cultivation of the vine, and prepared intoxicating drink from the grapes. In order to impart his discovery to mankind, or, as some say, because Here smote him with madness, he wandered through many countries attended by the nymphs, who were crowned with ivy and vine-leaves, and bore in their hands the *thyrsus*, a pole bound round with leaves and fruit. This expedition, according to a later form of the myth, extended to Bactria and Media, to Egypt and India, where B. is said to have erected pillars as the eastern boundary of the world. Wherever he came in his wide progress, there is a Nysa to be found. The worship of the god, which came originally from the east, and was introduced into Greece by Melampus, was thus spread over nearly the whole of the then known earth, and at the same time the myth of B. was variously modified among the different peoples, so that it has become one of the most perplexed and difficult. B. was, besides, the protector of fruit-trees, and of fruits in general. His worship being thus extensively spread, and his festivals being held with music and song, he naturally received a great many surnames; for example, he was called Lenæos, from the wine-vat (*lenos*); Bromius, from shouting, (*bromos*); Euios (in Latin, Evius), from the exclamation *Euoi*, etc. The mythical march or expedition above spoken of, was suggested to the fancy by the bacchanalian festivals, at which bacchantes roved about in feigned madness, and made midnight processions to the mountains by torch-light. B. met with much opposition on his expeditions, many refusing to acknowledge his divinity. Thus, Lycurgus, king of the Edones, opposed him, and also Pentheus of Thebes, who was on that account torn to pieces by his own mother and her sisters. The daughters of Mynias (q.v.), who refused to celebrate his festivals, were punished by him with madness and metamorphosis. As he was crossing to Naxos, the Tyrrhenian sailors wished to carry him off to Italy, and, with this view, bound him; but the chains fell off, vines and ivy entwined the ship, and held it fast in the middle of the sea. B. changed himself into a lion, and the sailors from terror leaped into the sea, where they were transformed into dolphins. Those, on the contrary, who received him with hospitality and reverence, were rewarded; such as Midas (q.v.). In general, the character of B. is mild. In works of art, his type is that of a youth inclining to effeminacy. His peculiar ornament is the fillet. The long blonde hair is bound up in a knot behind, and only a few locks fall down on both sides over the shoulders; the hair is surrounded by a twig of vine or of ivy. His figure is neither stout nor slim. He is usually represented quite naked; sometimes with a wide robe negligently thrown over, which either covers a part of the shoulders and thighs, or, though more rarely, enwraps the greater part of the body. Frequently, a deer-skin hangs across the breast; at times, he wears shoes, more rarely, buskins. From this, the properly Grecian B., the bearded or Indian B. is completely distinct. This last appears in a more dignified, lofty, regal form; he is clad in a tunic reaching to the feet, over which he wears a wide and splendid mantle. As a warrior, he wears a short tunic girded round the waist, with buskins on the feet; a panther's skin serves him for a shield. In addition, he is to be seen at times with horns. After the institution of the Eleusinian mysteries, the service of B. was conjoined with these; accordingly, Pindar makes him the companion of Demeter. As the followers of Orpheus held him to be also Apollo, he is associated with the Delphic oracle.

The worship of B. consisted in noisy rites. Thebes, in Bœotia, held to be the birthplace of the god, was considered the chief seat of those rites in Greece. In Athens, the worship of the Lenæan B. was the most ancient, and may be traced back to ante-historic times. The chief offerings made to him were goats and oxen; the last, because he himself was conceived and represented under the form of an ox. The Bacchic festivals deserving special notice are—1. The Attic Dionysia, of which the minor, or country Dionysia, was celebrated in the country in the month Poseideon, at the time of the grape-gathering. Among the characteristic amusements of the occasion were the

Askolia, which consisted in smearing full wine-skins (*askoi*) with oil, on which the young peasants attempted to leap with one foot, and by their frequent falls produced merriment. There were also dramatic entertainments. This festival was probably held at the approach of the wine-harvest, and that of the Haloa at its close. These were followed, in the month Gamelion, by the festival of the Lenæa, which was peculiar to the city of Athens. The festivities on the occasion, besides theatrical representations, consisted in a great banquet, for which the state provided the meat, and in a procession through the city, attended with the jesting and raillery usual at Bacchic ceremonies. After the Lenæa came the Anthesteria, on the 11th, 12th, and 13th of the month Anthesterion, when the new wine was first drunk. On the second day of this festival, the chief solemnity consisted in a great public dinner, at which the guests, crowned with flowers, and to the music of trumpets, entered into regular contests in drinking, and in a private sacrifice for the prosperity of the state offered by the "king archon's" wife, who was at the same time symbolically married to the god. On the third day, a sacrifice was offered to the Chthonian Hermes and to the souls of the dead. Last came the great Dionysia, which was celebrated in the month Elaphebolion, and at which new comedies and tragedies were represented. 2. The Triateric Dionysia, which were celebrated every third year in the middle of winter. The performers were women and girls (called in Gr., *Mænades;* in Lat., *Bacchæ* or *Bacchantes*), and the orgies were held at night, on the mountains, with blazing torches and the wildest enthusiasm. This mystic solemnity came from Thrace, and its institution is referred to Orpheus. When it was adopted in Greece, cannot be exactly determined. It is earliest met with in Bœotia, particularly at Thebes, where the Cithæron was the scene of celebration. An important place in connection with it is also Parnassus, on the highest summit of which the women of Attica and Delphi celebrated nocturnal orgies in honor of B. and Apollo. The Mænades or Bacchantes were clad on the occasion in fawn-skins, swung about the "thyrsus," made a great noise with clapping of hands, and danced wildly with streaming hair. In this ecstatic solemnity, the god himself was represented by the victim sacred to him, the ox, which the Mænades in their fury tore in pieces. In the most ancient times, even human sacrifices were not uncommon. Descriptions of these wild and terrible rites are not unfrequent in the poets. 3. The Bacchanalia of later times, the foundation of which was laid in Athens during the Peloponnesian war, by the introduction of foreign rites. From Greece they were carried to Italy. As early as 496 B.C., the Greek worship of B. was introduced at Rome along with that of Ceres; and Ceres, Liber, and Libera were worshiped in a common temple. In honor of these deities, the Liberalia were celebrated on the 17th of Mar., and were of a yet simpler and ruder kind than the great Dionysia of Athens. Afterwards, however, these rites degenerated, and came to be celebrated with a licentiousness that threatened the destruction of morality and of society itself. They were made the occasion of the most unnatural excesses. At first, only women took part in these mysterious Bacchic rites, but latterly men also were admitted. When the evil had reached its greatest height, the government (186 B.C.) instituted an inquiry into it, and rooted out the Bacchanalia with the greatest severity. This was the occasion of the well-known *Senatûs Consultum de Bacchanalibus*. Mention of them, however, still occurs at a later period under the emperors.—Wild, excessive revels are still called Bacchanalia.

BAC'CIO DELLA PORTA, better known by the name of FRA BARTOLOMEO DI SAN MARCO, one of the most distinguished masters of the Florentine school of painting, was b. at Savignano, in Tuscany, in 1469. His first teacher was Cosimo Roselli; but he owed his higher cultivation to the study of the works of Leonardo da Vinci. His subjects are mostly religious, and by far the greater part of his pieces belong to the later years of his life. He was a warm adherent of that bold reformer of church and state, Savonarola (q.v.), after whose tragical end he, 1500, took the habit of the cloister, and for a considerable time renounced art. The visit of the young Raphael to Florence in 1504 seems to have been instrumental in stimulating him to return to it. He imparted to Raphael his knowledge of coloring, and acquired from him a more perfect knowledge of perspective. The two remained constant friends—B., on one occasion, finishing certain of Raphael's unfinished works, Raphael performing a like kindness for him at another time. B. died at Florence, 1517. The greater number of his works are to be seen at Florence, in the gallery of the Pitti palace.

BACH, Baron ALEXANDER, an Austrian statesman, was b. Jan. 4, 1813, at Loosdorf, in lower Austria, where his father held a judicial office. The young B. received a careful education. At the age of 24, he was promoted to the rank of doctor of laws, and then entered the imperial service, in which he remained about 9 years. During this period also he traveled over the greater part of Europe and some of the countries of Asia. He was on terms of friendship with the members of the opposition of lower Austria, and belonged to that circle of young men who well understood the failings of the old system, and the inevitability of a change in the organization of Austria. He took an active part in founding the juridico-political reading club, and courageously defended it against the police. On the occurrence of the events of Mar., 1848, B. took a distinguished place as a mediator. He formed part of the provisional committee of the com-

mons, and was also chosen in April, by the states of lower Austria, one of their representatives in the central commission of the provincial states of Austria.

In this, the outset of his political career, B. already showed a leaning to those views which he afterwards manifested as minister. He advocated the centralization of the Austrian monarchy, and declared himself against the independence of Hungary, as well as against the entry of the German provinces of Austria into the German confederation. But he also desired an extension of the basis of the states, and of their parliamentary influence in the direction of public affairs. During the occurrences of the 15th of May, 1848, B. kept away from Vienna. When, after these occurrences, the old liberal opposition came to the helm, B. undertook the ministry of justice. He now entered with talent and energy into the remodeling of the whole system of Austrian law. On the other hand, the part he took in the assembly brought upon him the hatred of the "left," and of the democratic party generally. The opposition was particularly bitter on the question of removing the burdens from peasant proprietors, on which B. maintained the principle of compensation, and wished a part of that compensation to be made good by those who had hitherto borne the burdens in question. His policy, also, with regard to Hungarian affairs met with violent opposition from the "left." In the events of the 6th of Oct., 1848, B. would have fallen a victim to popular fury, like the war-minister Latour, had he not found an opportunity of withdrawing from pursuit. On the formation of the Schwartzenberg-Stadion ministry, he again took the portfolio of justice, and participated in the measures regarding Hungary and all the other important steps taken by that ministry. On the withdrawal of Stadion in May, 1849, B. took his place at the head of the ministry of the interior, from which he was sent, in 1859, as plenipotentiary to Rome—a mission which terminated in 1865. Among his most important labors as minister of the interior are the constitutions for the different crown-lands, as well as the organization of their political administration.

BACH, JOHANN CHRISTIAN, 1735–82; eleventh son of Johann Sebastian B., was chosen one of the organists of Milan cathedral, but was occupied mainly in composition for the voice. In 1763, he produced, in London, the opera of *Orione*, which was successful. Schubert says: "This man had it in his power to be whatever he would, and he may well be compared to the Proteus of fable. Now he spouts water; now he breathes forth flame. In the midst of the trivialities of his fashionable style, the giant spirit of his father may be discovered."

BACH, JOHANN CHRISTOPH, 1643–1703; eldest son of Heinrich, and one of the best organists and composers of his time. His compositions show "that he was truly a great man, as rich in invention as he was strong in the power of musical expression of emotion."

BACH, JOHANN CHRISTOPH FRIEDRICH, 1732–95; tenth son of Johann Sebastian, author of numerous compositions, ecclesiastical and secular. He was nearly all his life kapellmeister to the duke of Lippe Schaumburg.

BACH, JOHANN SEBASTIAN, a celebrated musician, b. at Eisenach, upper Saxony, in Mar., 1685. When he was ten years old, his father, who was a musician at Eisenach, died, and B. sought the protection of an elder brother, who dying soon after, he was again left destitute, and, to earn a livelihood, entered the choir of St. Michael's, Lüneburg, as a soprano singer. In 1703, he became court-musician at Weimar, and the following year, organist to a new church at Arnstadt. His reputation in this capacity soon spread, and in 1708 he was appointed court-organist at Weimar, by the reigning duke. While holding this office, he labored assiduously to make himself master of every branch of music. In 1717, he was made director of concerts, and six years afterwards, director of music, and cantor to St. Thomas's school, Leipsic, an appointment which he held to his death. About ten years later, the honorary distinctions of kapellmeister to the duke of Weissenfels, and court composer to the king of Poland, were conferred upon him. B., who had a son in the service of Frederick the great, received a pressing request to visit Potsdam on the occasion of a concert there. He went, and acquitted himself greatly to the satisfaction of that monarch, some of whose music he played at first sight. B.'s close studies affected his eyes, and an operation, designed to benefit them, left him totally blind, and hastened his death, which took place in July, 1750. With the exception of Handel, B. had no rival as an organist; and his compositions for the organ have a deservedly high reputation. They are too elaborate, however, ever to become very popular, though his fame as a composer is sure to advance with the progress of scientific musical culture. The highly educated musician will best appreciate the grandeur of some of his works. In 1850, a Bach society for the study and practice of his compositions was formed in London, and since that time they have often been publicly performed in this country. Three of his sons were also musicians of some note. One of them, Johann Christian, held the appointment of music-preceptor to queen Charlotte.

BACH, KARL PHILIPP EMANUEL, 1714–88; second son of Johann Sebastian. He was probably the most highly gifted of the eleven brothers, and his influence on the development of certain musical forms gives him a prominent place in the history of the art. He studied in the Thomas school, and afterwards in the university of Leipsic, where jurisprudence was his preference. In 1738, he went to Berlin, and soon afterwards was

appointed chamber-musician to Frederick the great. In 1767, he became kapellmeister at Hamburg, where he passed the remainder of his life. His most ambitious composition is the oratorio of *Israel in the Wilderness*. The greater portion of his numerous works was written for his favorite instrument, the clavier (the piano of that day). His essay on *The True Method of Harpsichord Playing* was long a standard work. Clementi professed to have derived from B. his distinctive style of piano-forte playing, and Haydn is said to have acknowledged his deep obligation to B.'s works. It was from these works that Haydn learned the form of the sonata and symphony, of which B. "may fairly claim to have been the originator, though Haydn enriched it and gave it permanence." As a psalm, ode, and song writer, B. surpassed his contemporaries, and gained great popularity. His idea of the purpose of music he explained by saying: "In my opinion the grand object of music is to touch the heart, and this end can never be obtained by mere noise, drumming, and arpeggios; at all events not by me."

BACH, VEIT, a German Protestant of Presburg, Hungary, by trade a baker; founder of the remarkable musical family of Bach.

BACH, WILHELM FRIEDMANN, 1710–84; eldest son of John Sebastian. He was a natural musician, nearly rivaling Mozart in precocity, and remarkable for extemporaneous composing. At Leipsic university he studied jurisprudence and mathematics; but music was not neglected. He was organist of St. Sophia's church, Dresden, and director and organist at Halle. Though acknowledged to possess the highest genius, he was so coarse, rude, and ill-tempered as to be unbearable. He was also strangely absent-minded, and a slave to drink.

BACH'ARACH, a small t. of Rhenish Prussia, romantically situated on the left bank of the Rhine, 22½ m. above Coblenz. It has a pop. of (1871) 1687, with a brisk trade and a good deal of commerce by river-craft. It is said to have derived its name from Bacchus (*Bacchi ara*), and the vine is still largely cultivated in the neighborhood—the wine produced being of a superior quality. B. is noteworthy also as the place where Blucher crossed the Rhine, on Jan. 1, 1814.

BACHE, ALEXANDER DALLAS, 1806–67, an American physicist; b. in Philadelphia. He was great-grandson of Benjamin Franklin; graduated at West Point, as lieutenant of engineers, in 1825, remaining some time in the academy as a teacher. He was employed under col. Totten on the fortifications at Newport, where he married Nancy Clarke Fowler. B. was professor of natural philosophy and chemistry in the university of Pennsylvania, and an early member of the Franklin institute, the journals of which gave an account of his scientific labors. In company with others he built an observatory in which, for the first time in the United States, the periods of the daily variations of the magnetic needle were fully determined, and other interesting observations made. In 1836, he became president of the trustees of Girard college, and visited Europe to examine educational systems for the information of the board, who were about to arrange the plan of the institution. His report in 1838 was of great value in suggesting improvements in our educational system. Before the college was organized, B. established a system of free education in Philadelphia, serving for a time gratuitously, at the same time assisting the British association in the examination of meteorological and magnetic phenomena. In 1842, he returned to his professorship in the university, and in 1843 was appointed successor to Hassler in the U. S. coast survey. This important service he reorganized and brought to its present recognized efficiency. He was also light-house commissioner, superintendent of weights and measures, regent of the Smithsonian institution, vice-president of the U. S. sanitary commission, received the degree of LL.D. from several colleges, medals from foreign governments and learned bodies, was president of the American philosophical society, president of the association for the advancement of science, and associate of many important scientific institutions at home and abroad. He gave $42,000 to the national academy of science for the promotion of its object. His important works are: *Observations at the Magnetic and Meteorological Observatory of Girard College*, reports on weights and measures, and various essays in the *Proceedings of the Association for the Advancement of Science*.

BACHE, BENJAMIN FRANKLIN, b. Va., 1801; great-grandson of Benjamin Franklin; graduated at Princeton, and in medicine at Pennsylvania university; assistant-surgeon in the army in 1824, and surgeon in 1828; professor of natural science and natural religion in Kenyon college; fleet surgeon of the Mediterranean squadron in 1841, and of the Brazil squadron in 1848. He established at New York the laboratory that supplied the medical department of the navy, and was director from 1855 to 1871, rendering important service to the union armies during the rebellion by supplying the laboratory from his own resources. In 1871, he was made medical director, with the rank of commodore.

BACHE, RICHARD, b. England, 1737; d. Penn., 1811; a Philadelphia merchant, son-in-law of Benjamin Franklin, and first U. S. postmaster-general.

BACHE, SARAH, only daughter of Benjamin Franklin, 1744–1808. During the revolution she was active in collecting clothing and money for the suffering patriot armies, at one time employing more than 2000 women and girls in making garments for sol-

diers. She also served in the hospitals, and was otherwise noted for patriotism and benevolence.

BACHELOR (Fr. *bachelier*, Lat. *baccalaureus*, or, as it is variously written in old documents, *baccalareus*, *bacularius*, and *bacillarius*). This word, which first makes its appearance in middle-age Latin, is of very uncertain etymology, and its primary meaning is consequently involved in obscurity. The usual derivation, from *bacca laurea*, a laurel berry, gives us little help; but the Spanish *bachiller*, which means at once *a babbler* and a master of arts, taken in conjunction with the Portuguese *bacharel* and *bacillo*, a shoot or twig of the vine (from the Latin *baculus* or *baculum*, a stick or shoot), and the French *bachelette*, a damsel, seem to point to its original and generic meaning, which probably was *a person shooting, or protruding from one stage of his career into another more advanced.* With this general signification, all the special meanings of the word given by Ducange seem to have some analogy. 1. It was used, he says, to indicate a person who cultivated certain portions of church-lands called *baccalaria*—which he supposes to have been a corruption of *vasseleria*—a feu belonging to an inferior vassal, or to one who had not attained to a full feudal recognition. 2. It indicated ecclesiastics of a lower dignity than the other members of a religious brotherhood—i.e., monks who were still in the first stages of monkhood. 3. It was used by later writers to indicate persons in the first or probationary stage of knighthood; i.e., not esquires simply, but knights who, from poverty and the insufficient number of their retainers—from their possessing, perhaps, only the *baccalaria* above referred to—or, from nonage, had not yet raised their banner in the field (*levé bannière*). 4. It was adopted to indicate the first grade or step in the career of university life. As an academical title, it was first introduced by pope Gregory IX. in the 13th c., into the university of Paris, to denote a candidate who had undergone his first academical trials, and was authorized to give lectures. but was not yet admitted to the rank of an independent master or doctor. At a later period it was introduced into the other faculties as the lowest academical honor, and adopted by the other universities of Europe. See DEGREES, UNIVERSITY. 5. It came to be used in its popular meaning of an unmarried man, who was thus regarded as a candidate or probationer for matrimony.

The legislation of almost every country, at some period of its history, has imposed penalties on male celibates or bachelors, on the principle that every citizen is bound to rear up legitimate children to the state. By the Jews, the command, "Be fruitful and multiply," was interpreted strictly, and every Hebrew regarded marriage as a duty. In Sparta, where the interests of the individual were entirely sunk in those of the state, criminal proceedings were authorized by the laws of Lycurgus not only against those who neglected to marry, but against those who, from marrying late in life, or any other cause, formed such alliances as rendered the procreation of healthy children unlikely. By the laws of Solon, celibacy was also treated as a crime, though the practice of interfering with the feelings of the individual in this respect early fell into desuetude at Athens. At Rome, penalties and disabilities were imposed on unmarried men from an early period, and latterly on unmarried women also. In the allotment of the Campanian lands, Julius Cæsar gave portions only to those who had three or more children; and in later times we have the *jus trium* (*quatuor et quinque*) *liberorum*. The most important provisions on this subject are contained in the law (or rather the laws, for it consisted of an act and an amended act) called Lex Julia et papia poppæa, the first portion of which belongs probably to 18 B.C., and the second portion to 9 A.D. In addition to various other provisions regarding marriage, this law imposed penalties on those who lived in a state of celibacy after a certain age. No unmarried person could take a legacy, whether of a portion or of the whole possessions of a deceased person, unless he complied with the law—i.e., got married within 100 days from the testator's death. Widows were at first allowed 1 year from their husbands' death, and divorced women 6 months from the time of the divorce, before they came within the penalties of the law; and these periods were afterwards extended to 2 years, and 1 year and 6 months respectively. The original provisions of the law did not apply to men beyond 60, or women above 50, but they were extended to them by subsequent enactments, and made perpetual even in case of their marrying. The *senatûs consultum* passed in the time of Claudius, however, again exempted men above 60 who married wives under 50, as from their unions it was supposed there was a fair prospect of issue. Childless married persons, moreover, from the ages of 25 to 60 in males, and 20 to 50 in females, were subject to the penalties of the *lex*, to the extent of losing one-half of any inheritance or legacy which might be bequeathed to them. The lex papia also contained a provision by which a candidate who had several children was preferred to one who had fewer; and various other premiums on fruitfulness were held out both at Rome and in the provinces.

In Britain, there are numerous instances of additional or higher taxes being imposed on bachelors and widowers, but apparently more with a view to the revenue than with any other object. Of this 6 and 7 Will. III. c. 6, which was passed in 1695, and which granted to his majesty certain rates and duties upon marriages, births, and burials, and upon bachelors and widowers for five years, "for carrying on the war against France with vigor," is an instance; and another, probably, may be found in the higher charge

for the servants of bachelors, first imposed by Mr. Pitt in 1785, and continued for a considerable time. By 52 George III. c. 93, unmarried daughters of persons alive were exempted from the tax upon hair-powder; and in the income-tax of 1798, deductions were made on account of children, 5 per cent being allowed to a person who had a family, and whose income was above £60, and under £400 a year, corresponding deductions being made in other cases. Much might be said in favor of such distinctions, on the ground of expediency, as they enable the government to impose a higher taxation, by lessening the burden on those members of the community who are most likely to complain; but their recognition in practice would, no doubt, be regarded as impossible by the financiers of our day, who have hitherto failed to distinguish between income derived from realized property and from personal labor.

BACHELOR, KNIGHT (qu. *bas chevalier*), the lowest grade of knighthood, now only conferred in the United Kingdom. Originally, like all knighthood, a military distinction, knighthood of this description came to be often bestowed on civilians, and in recent times it has frequently been conferred for no weightier service than carrying a congratulatory address to court. It is generally conferred by the sovereign by a verbal declaration accompanied with the imposition of the sword, and without any patent or instrument. The person who is to receive the honor kneels down before the sovereign, who touches him on the shoulder with a naked sword, saying, in French, "*Sois chevalier au nom de Dieu*" (Be a knight in God's name), and then adds: "Rise, Sir A. B." In exceptional cases, persons have been made knights bachelor by patent. The lord-lieutenant of Ireland occasionally exercises a right of conferring knighthood. See KNIGHT.

BACHIAN, one of the Molucca islands just s. of the equator, 127° e. It has about 800 sq.m.; is of irregular form, and mountainous. Hot sulphur springs bespeak volcanic action. The island is well wooded, and sago, cocoa nuts, and cloves are abundant. There is one large grove of nutmeg trees. It is the most eastern point on the globe inhabited by any of the quadrumana. The people are the Sirani, or Christian descendants of the Portuguese, some Malays, a few Papuans, and a colony from the Celebes. The government is headed by a sultan under the protection of the Dutch. The chief town is called Amassing by the natives.

BACHMAN, JOHN, b. New York, 1790; naturalist and Lutheran minister, pastor in Charleston, S. C., in 1822. He was assistant to Audubon, and chief author of the work on North American quadrupeds. Among his own works are: *A Defense of Luther*, and *Characteristics of Species and Genera as Applicable to the Doctrine of the Unity of the Human Race.*

BACIOCCHI, MARIE-ANNE-ELISA BONAPARTE, the eldest sister of Napoleon Bonaparte, was b. at Ajaccio, Corsica, in 1777. When that island was occupied by the English, she, with her family, emigrated to Marseille. Here she married, at the age of 20, a countryman of her own, capt. Bacciocchi. The elevation of Napoleon raised her also to rank and power; and in 1806, the principality of Massa and Carrara was intrusted to her administration, which was, on the whole, a beneficial one for the people. In 1809, she was made grand duchess of Tuscany, and appointed as administrator over that country in Napoleon's name. Here the arbitrary measures of her brother, which she had to carry out, and her own self-will and harshness, rendered her anything but popular. Her husband took no part in the government. When the allies entered Tuscany in 1814, she of course had to leave Florence. She died, at Bologna, of nervous fever, in 1820.

BACK, in maritime language, has many technical applications. To *back an anchor*, is to support the large anchor by a smaller one, in order to prevent it from loosening and coming home in bad ground. To *back and fill*, is a mode of tacking when the tide is with a vessel, but the wind against her. To *back the sails*, is so to arrange them as to make the ship move astern or backwards; it is done when the tide or current is with the ship, and light winds against her; and the maneuver is useful to avoid collisions in narrow channels, to bring the ship into a particular position during naval engagements, or to keep ships well asunder when crowded in convoy. To *back the maintopsail*, and analogous operations to other sails, is so to arrange a sail that the speed of the ship's progress may be checked.

BACK, Sir GEORGE, a well-known traveler in the polar regions, was b. at Stockport in 1796. He entered early on a naval career, and accompanied Franklin and Richardson in their expedition to the n. coast of America. He volunteered to the government to go in search of capt. Ross, who was supposed to have been lost in his attempt to discover the north-west passage; and his offer having been accepted, he left London, Feb. 17, 1833, and on the 28th of June, started from Norwayhouse, a station of the Hudson Bay Company, on his journey to the north. After passing a terrible winter with his companions at Slave lake, he discovered, in 1834, Artillery lake, and the Great Fish river, or Back's river, which he followed to the Frozen ocean. Being hindered by the ice from preceding along the coast as far as cape Turn-again, he returned by the river; but although he had received news of the return of capt. Ross, he continued his explorations in the North sea, and did not return to England until 1835, when he was raised to the

rank of post-captain for his services. In 1836 and 1837, he further explored the arctic shores in the interests of geography—the geographical society, in the latter year, bestowing its gold medal upon him. Two years afterwards, he was knighted, and had a lucrative treasury appointment bestowed upon him. He attained flag rank in 1857, and that of admiral in 1867. He d. in June, 1878.

BACKERGUN'GE, a t. of Bengal, situated on B. creek, an offset from the Ganges, in lat. 22° 43′ N., and long. 90° 22′ E.—125 m. to the E. of Calcutta. Till supplanted by Burrisol, which is 12 m. to the N., it was the capital of the district of the same name.

BACKERGUN'GE, the district named from the foregoing town. It extends in N. lat. from 22° 2′ to 23° 13′, and in E. long. from 89° 49′ to 91°, containing 4935 sq.m., and (1871) 2,377,433 inhabitants, or about 480 inhabitants to a sq.m. Like the rest of the great delta of Bengal, B. is of alluvial formation and level surface, being watered at once by the lower streams of the Ganges and the Brahmaputra, and also by the various branches or offsets which interlace together those mighty rivers. In consequence of the great number of water-courses, which at once cool the atmosphere and drain the soil, the country is fertile, and the temperature is said never to rise above 88° in the shade. From the same cause, the district is independent of regular roads for intercourse and communication. In the season of high-water, as may be expected, inundations are common. To guard against them, the houses are built on mounds; while the corresponding excavations, like the natural "water-holes" of Australia, serve as tanks against the effects of the dry season. As is often the case in alluvial regions, land-slips are frequent, and also the opening of new channels for the streams. The productions are rice, sugar, cotton, pulse, mustard, cocoa-nut, betel-nut, mango, guava, plantains, limes, pine-apple, ginger, and turmeric. Buffaloes are said to be generally used instead of oxen, of which the domestic breed is small and poor.

BACKGAMMON is the modern name of a game of considerable antiquity in England, where it was formerly known by the appellation of "the tables." The words *backgammon* have been ascribed to the Welsh tongue, in which they are said to signify *little battle;* but Strutt, with greater plausibility, traces the term to the Saxon "*bac* and *gamen* —that is, back-game—so denominated because the performance consists in the two players bringing their men back from their antagonist's tables into their own; or because the pieces are sometimes taken up and obliged to go back—that is, re-enter at the table they came from." Whatever be the etymology of the term, the game has been long established in the country; and as a fireside amusement of a decorous nature, is a favorite among clergymen, squires, farmers, and retired professional persons.

B. is played with an apparatus consisting of a board or tables, men or pieces, dice, and dice-boxes. The introduction of dice into the game, and their constant use in determining moves, makes B. essentially a game of chance, and therefore brings two players of unequal talents nearer a level than other diversions in which skill is the sole or predominant element. The B. board consists of two parts or tables, generally united by a hinge in the middle, by which they can be shut up as a box. Each table possesses twelve points, six at each end. These points are colored white and black alternately; but this variation of color has no reference to the game, and is only done to make the points more easily counted. The game is played by two parties, and with 30 pieces or men; each party has 15 men, one set of 15 being black, and the other white. In beginning the game, the men are placed on certain points on the tables, as shown in the following figure. The game is played with two dice and two dice-boxes. The dice are common to both; but each party uses his own dice-box, and the throws are alternate. Each die is a perfect cube, marked on its sides with dots from 1 to 6. The 1 is called *ace;* the 2, *deuce;* the 3, *tre* or *trois;* the 4, *quatre;* the 5, *cinque;* and the 6, *size.* At every throw, the two dice are employed; consequently, a person may throw from 2 up to 12—that is, two *aces* up to two *sizes.* If a player throw *doublets,* or both dice of one number, double the number of dots is reckoned; thus, by a throw of two aces, the player does not count 2, but 4. These numbers thrown or accidentally turned up by the dice, bear a reference to the points on the tables. In order to understand this connection between the dice and the men, the learner must observe how the men are placed on the points, and the rules by which their shifting from one to another is governed.

The tables are here spread out as if two partners were seated, and about to begin to play. The party owning the white men is seated at W, and the party owning the black men at B. We shall call one party White, and another Black. White counts round from the ace-point of Black, and Black counts round from the ace-point of White. These ace-points are respectively seen to have two men upon them in opposite corners of the same table. The grand object of the game is for each party to get all his men played round into the table containing the aces, removing them from point to point agreeable to the throws of the dice. In throwing, the number upon each die turned up may be reckoned by itself, or collectively, with the number on the other die. Thus, if quatre be thrown by one die, and size by the other, a man can be advanced 4 points, and another 6 points; or one man can be advanced 10 points, always providing that a point is open to suit this movement to it. No point can be moved to if covered by two men belonging to the adversary. If covered by only one man, which is called a *blot,* then that man can be hit, and be removed from the point, and placed on the bar between the tables, his

place being taken by the man who has won it. The removal of a man to the bars throws a player considerably behind in the game, because the man must remain out of the play till the dice turn up a number corresponding to one open point on the adversary's table. Being fortunate to get an open point by this means, the man must be entered and wrought round from thence, as in the case of others in the set to which he belongs. The frequent occurrence of this hitting of a blot gives an adversary a great advantage, and allows him to win the gammon. There are two kinds of victory,—winning the hit, and winning the gammon. The party who has played all his men round into his own table, and by fortunate throws of the dice has borne or played the men off the points first, wins the *hit*. The gammon may be explained as follows: When you have got all your men round to your own table, covering every point, and your adversary has a man out, then you are enabled to *bear* or lift your men away. If you can bear all away, so as to clear your table before the adversary gets his man placed by a throw on your table, you win the gammon. If the adversary has been able to bear one before you have borne all your men, it reduces the victory to a hit. Two hits are reckoned equal to one gammon in playing matches. To win two games out of three is called winning the *rub*, as at whist.

BACKHUYSEN, LUDOLPH, one of the most famous painters of the Dutch school, a master in marine painting, was b. at Emden in 1631. His parents intended him for a commercial career; but he had not been long in a mercantile office in Amsterdam, to which he had been sent at the age of 18, before he resolved to devote himself to painting, and with that object received instruction from Evendingen, and attained, in a short time, extraordinary skill and readiness in execution. He was a close student of nature; so much so, that on the approach of a storm he often put to sea in a boat, in order to watch and sketch its effects, which he transferred to canvas immediately on his return home. His most famous picture is the sea-piece in the gallery at Paris, which he was commissioned to paint by the magistrates of Amsterdam, and which was, in 1665, sent as a present to Louis XIV. In all his pictures, the utmost truthfulness prevails, at the same time that they embody all the poetry of the sea. His coloring is also excellent. After he was 71 years old, he began etching on copper. He also made attempts in poetry, and gave lessons in writing, an art which he did much to promote. He d., after long illness, in 1709.

BACK-STAYS are long ropes which extend from the topmast-heads down to the sides of a ship, where they are fastened in such a way as to assist the shrouds in supporting the masts. Different kinds are distinguished as *after-B.*, *breast-B.*, and *traveling-stays*. One rope generally forms a pair of B.; being looped in the middle to pass over the mast-head.

BACKUS, CHARLES, D.D., 1749–1803; a native of Connecticut, a graduate of Yale, and Congregational pastor in Somers, Conn. He was for many years a teacher of theology, and had the training of such men as Dr. Woods of Andover, president Moore of Amherst, and president Davis of Hamilton college.

BACKUS, ISAAC, 1724–1806; a native of Connecticut. He left the Congregationalists for the Separatists, or New Lights, and these sympathized closely with the Baptists, of whom B. became a leader, and by his own exertions largely increased the prosperity of the denomination. He was a strong advocate of the entire separation of church and state, and went before the continental congress in 1774 to ask for the Baptists the same privileges that were granted to other sects. His principal work is a history of New England with particular reference to the Baptists. This history he abridged, and brought down to 1804.

BACOLOR', a t. of the island of Luzon, Philippines, the capital of the province of Pampanga, 38 m. n.w. from Manila. Pop. 8737. It stands in a plain, near the river Pampanga, with which it is connected by a canal.

BACON (from a root in the Teutonic languages which seems to be allied to the Lat. *vacca* [in mid. Lat. *baca*], a cow, and to have signified an animal in general; *bache*, in Ger., signifies among hunters a wild sow; *bake*, in Dutch, a swine in general) is the cured sides of a pig; while bacon-hams are the hind-legs cured. The mode of curing will be described under HAMS; and their properties as articles of food, under PORK.

BACON, ANNE, 1528–1600; wife of sir Nicholas B., second daughter of sir Anthony Cooke, sister of the wives of lord Burleigh, sir Henry Killigrew, and sir John Russell, and mother of lord Bacon. Her father, from whom she acquired a superior education, was tutor of Edward VI.

BACON, DELIA, 1811–59; sister of Leonard, eminent as a teacher; author of *Tales of the Puritans*, *The Bride of Fort Edward*, and *Philosophy of the Plays of Shakespeare Unfolded*, in which she endeavors to prove that lord Bacon was the real author of the Shakespearean plays.

BACON, FRANCIS, Lord VERULAM, Viscount ST. ALBANS, b. in London, Jan. 22, 1561, was the son of Sir Nicholas Bacon (q.v.). His mother was the learned Anne Cooke. In early childhood, he manifested superior powers, and an ardent love of knowledge; his intelligence was so precocious, and his sedateness so remarkable, that the queen took

pleasure in calling him her "young lord keeper." At the age of 13, he was sent to the university of Cambridge, which he quitted, after a residence of three years, with a low opinion of the course of study pursued there, and, as well, of the Aristotelian philosophy. On leaving the university, he went to Paris, in the suite of Sir Amias Paulet, the English ambassador, and there occupied himself chiefly with statistics and diplomacy, the result of his studies and observation being a work, afterwards published, *Of the State of Europe*. The sudden death of his father, about the end of 1579, recalled him in 1580 to England, where, after failing to procure from the government a provision which would enable him to devote himself to science and literature, he betook himself for several years to the study of law. His professional progress was at first very slow, and, contrary to what might have been expected, it was long before he could obtain promotion in the public service. This want of success was chiefly owing to the hostility of his uncle, the queen's first minister, lord Burleigh (see CECIL), who regarded him as a dangerous rival to his own son. To lord Burleigh and his son, B., in the hope of advancement, had paid court till it was clear no favor was to be expected from them, when he betook himself to their rival, the earl of Essex, whose friendship he speedily won. But the earl's influence could not counteract the continued opposition of the Cecils, through whom he was defeated, in 1594, in an attempt to obtain for B. the then vacant office of attorney-general. What he could do for his friend, however, he did; for shortly after this disappointment he presented him with an estate at Twickenham worth £2000 a year. It is painful to relate that B. repaid the generous friendship of his patron with flagrant ingratitude. When Essex was subsequently brought to trial for a conspiracy against the queen, B. came forward as his accuser with tongue and pen; he unnecessarily appeared as counsel against the friend who had so largely obliged and confided in him, and used all his great talents and ingenuity as a pleader to magnify his crimes and secure their punishment. B. was straitened at the time in his circumstances, through his extravagant mode of life, and, moreover, was anxious to conciliate the court, whose anger he had provoked by having espoused the popular cause on his first entering parliament as member for Middlesex in 1595. But whatever the temptation was, it cannot affect our opinion of conduct so mean and immoral. It remains to be stated, that, after the earl's execution, he wrote, at the request of the queen, *A Declaration of the Practices and Treasons Attempted and Committed by Robert Earl of Essex*, which was printed by authority.

In 1590, B. obtained the post of counsel extraordinary to the queen, and a few years afterwards he entered parliament as member for Middlesex. It was not, however, till the reign of James I. that he made rapid progress. He was knighted in 1603, and in the following year was appointed salaried counsel to the crown; by 1613, he had advanced to the office of attorney-general, in which he unconditionally subserved the purposes of the court. His conduct as attorney, in attempting to extort by the rack a confession of treason from an old clergyman of the name of Peacham, has met with universal and deserved condemnation. He did not, however, cringe to the king and the royal favorite, Villiers, except to good purpose. In 1617, he was appointed keeper of the great seal, and in 1619 attained the dignity of the lord chancellorship, with the title of lord Verulam. In the year following, he was created viscount St. Albans.

Having attained the highest honors of the state by truckling to the king and his favorite, B. proceeded to abuse his judicial functions to increase his revenues, which, great as they were, were unequal to his extravagance. Though his official income was great, and his means had been enlarged by a marriage with the daughter of a wealthy alderman, he could only support his style of life by contracting debt and accepting bribes from suitors. Nor was money his only motive to false judgments; he more than once polluted the stream of justice, to maintain the favor of Buckingham. By 1621, the state of the courts had become so scandalous as to call for a parliamentary inquiry, which resulted in his being convicted, on his own written confession, of twenty-three acts of corruption. In consequence, he was condemned to pay a fine of £110,000, and to be confined in the Tower during the king's pleasure; he was banished for life from the court, and declared unfit to hold any office of state, or to sit in parliament. The fine, however, was remitted; the imprisonment lasted only two days; he was allowed again to appear at court, and, indeed, was summoned to sit in the very next parliament. Age, however, failing health, and perhaps shame, prevented him from appearing. Banished from public life, he henceforth devoted himself to literature and science, enjoying from the government a pension of £1200, and an annual income, in all, of £2500. His mode of life still, however, continued to be so prodigal and ostentatious that, at his death, in 1626, his debts amounted to upwards of £22,000. The immediate occasion of his death (as related by Aubrey, who probably got it from Hobbes, who was B.'s intimate friend) was cold caught in making an experiment to test the power of snow to preserve flesh. He died in the house of the earl of Arundel, to which he had been removed with the fatal chill upon him which he had caught in the course of the experiment.

While, on the whole, the public life of lord B. is marked by meanness and dishonor, his literary and scientific works are everywhere irradiated by the powerful light of an intellect which towered over those of other men. The first edition of his *Essays* appeared in 1597; his two books of the *Advancement of Learning* in 1605; his *Wisdom of the Ancients*—in Latin—in 1610; a third edition of his *Essays*, greatly extended, in 1612; his two books of the *Novum Organum*, or second part of the *Instauratio Magna*,

designed to consist of six parts—also in Latin—in 1620; his *History of the Reign of Henry VII.*, in 1622; his nine books, *De Augmentis Scientiarum*—a Latin translation and extension of his *Advancement of Learning*—in 1623. Besides these, he wrote several minor works, which need not here be specially mentioned. It is enough to say that his writings embrace almost all subjects, from jurisprudence—which he treated not as a mere lawyer, but as a legislator and philosopher—to morality and medicine. The *Sermones Fideles* is a treasury of the deepest knowledge of human relations, conveyed in a gorgeous and energetic style. Almost the only science with which he was unacquainted was that of mathematics. Thus singularly gifted and accomplished, he appeared at a time when science, from a variety of causes, started on that progress which has never since been arrested. If it is now a question how far he contributed by his genius to that progress at its commencement, it is a fact that he was long vulgarly regarded by his countrymen as the father of inductive philosophy—as having been the inventor and first teacher of the method of interrogating nature by observation and experiment and inductive reasoning. Nor are his writings wanting in materials qualified *ex facie* to support his title to that eminence. His claim to the distinction, however, has of late been the subject of much controversy, the result of which is that it has been generally disallowed. But if it be true that he had a somewhat vague and imperfect apprehension of the philosophy of induction, overestimated the province of observation, and undervalued the use of deduction and hypothesis, and that even his classification of the sciences in the *De Augmentis*, on which his reputation long turned, has been properly superseded by the superior and better-reasoned classification of M. Comte; still it must be borne in mind that he was one of the first that was aware of the true character of the positive philosophy, and who understood its conditions, and foresaw its final supremacy; and as for his classification, that it was a marvelous effort of reason at a time when the sciences were in their infancy, and many of them were yet unborn. Also, it must be said, that if B. cannot be claimed by the physicists as the father of their science, and they must look rather to Galileo, yet he may fairly be claimed in that character by the students of man and society; for he was the first to aim at the extension of the methods of positive philosophy to moral and social conceptions. If recent criticisms have dethroned him from the position which for centuries he occupied in relation to the physical sciences, by showing that neither his doctrines, experiments, nor writings have materially affected their course, it is only to leave him free to be placed in a position no less dignified in relation to human and social philosophy.

As a writer, B. presents us in combination an intellect at once one of the most capacious and profound that ever appeared among men—one of the most penetrating, one of the most far-reaching—and an imagination almost equally remarkable. In no other writer is so much profound thought to be found expressed in such splendid eloquence. "If," says Hallam (*Literature of Europe*, iii. 218), "we compare what may be found in the sixth, seventh, and eighth books *De Augmentis*, in the *Essays*, the *History of Henry VII.*, and the various short treatises contained in his works on moral and political wisdom and on human nature, from experience of which all such wisdom is drawn, with the rhetoric, ethics, and politics of Aristotle, or with the historians most celebrated for their deep insight into civil society and human character—with Thucydides, Tacitus, Philip de Comines, Machiavel, Davila, Hume—we shall, I think, find that one man may almost be compared with all of these together."

The collected works and life of lord B. were published by Mallet in 5 vols. (Lond. 1765); a good edition is that of Montague (16 vols., Lond. 1825–34); but the best, it is generally admitted, is the last (Works, 7 vols., edited by Spedding, Ellis, and Heath, 1858–59; *Letters and Life*, 7 vols., by Spedding, 1862–74). An able review of B.'s character is to be found among Macaulay's *Essays*. The *Encyclopædias Britannica* and *Metropolitana* contain valuable papers on his writings, on which also sir J. Herschel's *Preliminary Discourse* in *Lardner's Encyclopædia* may be consulted.

BACON, JOHN, a distinguished statuary, was b. in London, 1740, and d. there Aug. 7, 1799. He was at first a painter on porcelain, and only began to work in marble at the age of 23; yet in 1769 he received the first prize from the royal academy, of which he was soon after made a member. His statue of Mars first established his fame. Among his principal works are, two busts of George III., one in Christ Church college at Oxford, the other in the university library at Göttingen; the monuments of lord Chatham in Westminster abbey and in Guildhall; the statues of Howard and of Samuel Johnson in St. Paul's, and that of Blackstone at Oxford. B. was deficient in imagination, and had no refined perception of beauty.

BACON, LEONARD, D.D., LL.D., b. Michigan, 1802; son of a Congregational home missionary from New England; graduated at Yale in 1820, and at Andover in 1824; the next year, and until 1866, pastor of the First church in New Haven; acting professor of revealed theology in Yale from 1866 to 1871, and since then lecturer on ecclesiastical polity and American church history. He was one of the editors of the *Christian Spectator*, and is still an editor of the *New Englander*, of which he was one of the founders. He was also for 15 years one of the editors of the *Independent*. Dr. B. is the author of *Select Practical Writings of Richard Baxter, with a Life of the Author; Manual for Young*

Church Members, Slavery Discussed, and various historical discourses and essays. As a thinker and writer he is noted for breadth and vigor.

BACON, LEONARD WOOLSEY, D.D., b. New Haven, Conn., 1830; a writer and theologian, son of Leonard B., graduated at Yale, 1850. After officiating as a clergyman in various places, he was pastor, for longer or shorter terms, of the First church, Litchfield, Conn., of the New England Congregational church, Brooklyn, and of the First church, Stamford, Conn.; subsequently passed several years in Europe, chiefly in Geneva, as student, preacher, and writer; now pastor of the Park Congregational church, Norwich, Conn.

BACON, NATHANIEL, b. England, 1630-40; d. Va., 1677; a lawyer and member of governor Berkeley's council, leader of an alleged insurrection against the colonial government under pretense of resisting aggressions of the Indians. Berkeley was forced to make many concessions to demands for better government; but he broke his promises, and a brief civil war followed, in which Jamestown was burned (1676), and the governor took shelter in an English vessel. Before Bacon completed plans for re-establishing the government, he died from disease taken in an Indian campaign, and the rebellion soon came to an end.

BACON, Sir NICHOLAS, the father of lord Bacon, was b. in 1510, at Chiselhurst, in Kent. He received an excellent education; and being gifted by nature with sound and practical abilities, he quickly prospered in the legal profession, to which he attached himself. At the age of 27, he was appointed solicitor to the court of augmentations; two years later, on the dissolution of the monasteries by Henry VIII., he had the courage to present to that irascible monarch a reasonable project for applying the wealth which had been "rescued" from the church. It was this: that Henry should employ a portion of it in founding a college for the study of politics and diplomacy. Unfortunately, the king had already squandered it away in presents, and was unable to comply with the wise suggestion of the young lawyer; but probably he remembered his good sense, for, in 1546, Henry advanced him to the office of attorney of the court of wards, which he retained during the reign of Edward VI.; but his Protestantism necessarily caused him to be deprived of all public honors and emoluments after the subsequent Catholic succession. On the death of Mary, however, he was made a member of the Protestant part of the privy council, by queen Elizabeth; and in 1558, received at her hands the great seal. In the beginning of 1559, he opened parliament with a judicious speech on the difficult subject of a national religion. He was also president of that assembly of ecclesiastical disputants which met in Westminster two months later, to discuss the points of controversy between Protestants and Catholics. In 1564, he suffered a temporary eclipse of royal favor, on account of the too patriotic character of his religion; but through the persevering efforts of his old and constant friend, sir William Cecil, he was at length restored to the sunshine in which he had been accustomed to bask. Elizabeth even went the length of paying him a visit in 1577, at his magnificent mansion of Gorhambury, in Hertfordshire. He died on the 20th of Feb., 1579. Sir Nicholas was one of those solid and stately Englishmen to whose sagacity, high principle, and firm demeanor his country owed its safety in that critical period when Elizabeth mounted the throne.

BACON, ROGER, an English monk, who, through the force of his intellect, raised himself far above his age, made wonderful discoveries in several sciences, and contributed much to extend the then scanty knowledge of nature. He was descended of a respectable family, and b. at Ilchester, in the co of Somerset, 1214. He studied at Oxford, and then at Paris, where he received the degree of doctor in theology; and soon after his return home, he entered the order of the Franciscans, and settled at Oxford. Physics seems to have been at that time the chief object of his labors; and liberal friends of science supplied him with the means of pursuing his researches. In exploring the secrets of nature, he made discoveries and invented applications which were looked upon by the ignorant as the work of hellish magic. This prejudice was encouraged by the jealousy and hate with which his brother monks regarded his superiority. Besides, he loudly denounced the ignorance and immorality of the clergy, especially of the monks, and even wrote a letter to the pope, in which he represented to him the necessity of clerical reform. Out of revenge, an accusation was brought against him at the papal court, and the pope interdicted him from teaching in the university. He was shortly after imprisoned, forbidden all human intercourse, and hardly allowed sufficient food. Among the few clear-sighted men who admired Bacon's genius, and pitied his misfortunes, was the cardinal-bishop of Sabina, at that time papal legate in England. He desired to see Bacon's writings, but the interdiction of the Franciscans prevented a compliance with his wish. On his ascent to the papal throne as Clement IV., B. wrote to him, expressing his readiness to furnish him with whatever he desired, and Clement in reply repeated his request to see B.'s works, in defiance of the Franciscan prohibition. B. accordingly drew up his *Opus Majus* (edited by Jebb, 1733), which he sent, along with two other works, it is said, to the pope, by his favorite pupil, John of London, and in which he represented the necessity of a reformation in the sciences through a diligent study of the languages and of nature. How Clement received them is not very well known; but they could only have reached him about the time he was seized with his last

illness. For 10 years after Clement's death, B. was free from open persecution at least. But in 1278, under Nicolas III., the general of the Franciscan order, Jerome of Esculo, declared himself against B., forbade the reading of his books, and issued an order for his imprisonment, which was sanctioned by the pope. This new imprisonment lasted 10 years. When Jerome of Esculo became pope, under the name of Nicolas IV., B. sent him a *Treatise on the Means of warding off the Infirmities of Old Age* (Lat. Oxf. 1590; Eng., by Brown, 1683), with a view to convince him of the harmlessness and utility of his labors, but in vain. What the pope refused to the representations of the old philosopher, was yielded to the intercession of several influential English noblemen, and B. at last recovered his freedom. He returned to Oxford, wrote a compendium of theology, and shortly after died—according to some, in 1292, to others, in 1294.

B., although an extraordinary genius, could not rid himself of all the prejudices of his times. He believed in the philosopher's stone and in astrology. His chief invention is the magnifying-glass. There are also in his writings other new and ingenious views on optics; for example, on refraction, on the apparent magnitude of objects, on the great increase in the size of the sun and moon in the horizon. On other subjects, again, he fell into the greatest errors. He made several chemical discoveries which were wonders at that time. He knew, for instance, that with sulphur, saltpetre, and charcoal, we may imitate lightning, and produce explosions. Mathematics, applied to observation, he considered to be the only means of arriving at a knowledge of nature. He studied several languages, and wrote Latin with great elegance and clearness. Deserving of honorable mention are his discoveries of the errors that prevailed in the calendar, and his proposals and data for remedying them, in which he came very near the truth. He prepared a rectified calendar, of which a copy is preserved in the Oxford library. On account of his extensive knowledge, he received the name of "doctor mirabilis." Several of his works have never been printed, and are preserved among the Cottonian manuscripts in the British museum; some are to be found in French libraries.

BACON BEETLE. See DERMESTES.

BACS, or BACSKA, a co. in Hungary between the Danube and the Theiss, 3973 sq.m.; level and very fertile. Its products are wheat, wine, tobacco, horses, and cattle. A canal connecting the two rivers goes through the county. The chief towns are Zombor, the capital, Maria-Theresiopel, and Neusatz. The town of Bacs is on an affluent of the Danube; pop. '70, 3666.

BACSAN'YI, JANOS (pronounced Bat-shan-yi), a Hungarian writer and poet, was b. May 11, 1763, at Tapolcza, in the circle of Szalader. After studying at Vessprim, Oedenburg, and Pesth, he became tutor to the son of gen. Orczy, and while thus employed, published his first work, *The Valor of the Magyars* (Pesth, 1785). He received the same year an appointment in the finance department of Kaschau, and there, in conjunction with Baroti and Pazinczy, he began the *Magyar Museum* (Kaschau and Pesth, 1788–92). In 1793, in consequence of a liberal poem, he was deprived of his office, and in 1794, having taken part in the conspiracy of bishop Martinovich, he was carried to Spielberg, where he was confined till 1796. After recovering his freedom, he assisted in editing the *Magyar Minerva*, then came to Vienna, where he held an office in the bank, and married (1805) the German poetess, Gabrielle Baumgarten—an unhappy match. When the French entered Vienna in 1809, B. translated Napoleon's proclamation to the Hungarians, on which account he found himself afterwards obliged to take refuge in Paris. After the peace of Paris, he was given up, and had Linz assigned him as a compulsory residence, but was allowed to receive his French pension till his death. He died at Linz, May 12, 1845; the Hungarian academy had in 1843 again elected the octogenarian a corresponding member. In the latter part of his life, B., besides other works, published his *Collected Poems* (Pesth, 1827; Ofen, 1835). We are also indebted to him for the collected edition of the poetical works of Anyos (Vienna, 1798), and of Faludi (Pesth, 1824).

BACTE'RIUM, a minute and low form of vegetable organism, refractive, spherical, and mobile. It occurs as a fossil; is found in the sap of plants; in the fluids of men, animals, insects, larvæ and imagines, and eggs; is abundant in incipient stages of fermentation and decay of animal and vegetable tissues and substances. Bacteria act as a ferment, changing cane sugar and starch to glucose. They are communicated as germs floating in the air; they assist in the ripening of fruit, and in the regeneration of organic matter, during the formation of cell structure. They thrive equally well in acid, alkaline, or neutral fluids. Many phenomena, otherwise attributed to spontaneous generation, are caused by these minute and omnipresent organisms. Indeed, the difficulty attending most experiments concerning spontaneous generation lies in the uncertainty of removing such germs from an inclosed space, of killing such as remain, and preventing the ingress of others.

BACTRIA, the ancient name of the imperfectly known land lying between the western part of the Hindu Kush mountains, and the river Oxus (Amu, or Gihon), which separated it from Sogdiana on the n. and n.e. Its boundaries in early times cannot be precisely ascertained, but it is generally considered to have been identical with the modern Balkh (q.v.). B. is supposed to have been the seat of the parent-people

from which the Aryan (q.v.) or Indo-European family of nations branched off. The ancient Bactrians of historic times were akin to the Medes and Persians, and used the Zend language. B. was originally the center of a powerful kingdom, which extended itself over the e. of Persia, but we have almost no record of its early greatness; we only know that Ninus, the Assyrian king, in spite of his vast army, found much difficulty in conquering it, and that when Arbaces besieged the last Assyrian king, Sardanapalus, in his metropolis, he was assisted by a large force of Bactrians. It is believed that the ancient Persian religion was first developed in Bactra or Zariaspa, the capital of B., which was the head-quarters of the Magi till the land was overrun by the Arabs, and a center-point of the inland trade of Asia. The modern town of Balkh (q.v.) is built upon its site. Alexander, on his return from Persia, left in B. a colony of 14,000 Greeks, who here extended civilization. After the death of Alexander, B. was annexed to the kingdom of Syria; but was raised to independence by its governor, Diodotus I., who founded the Greek kingdom of new B. about 256 B.C. The history of this kingdom was formerly little known, but has been recently elucidated by numerous Græco-Bactrian coins found in the *topes* or burial-places of Afghanistan. These coins give the names of a series of kings, and bear indications of the political circumstances of the Greek kingdom of B. On those of Eucratides, a monarch who flourished in the age of Mithridates, there are found, beside the Greek characters, others which have been proved to belong to a dialect of the Sanscrit, and have been very happily deciphered by Mr. Prinsep.

BAC'TRIS, a genus of palms, of which nearly fifty species are known, all American. The leaves of some are pinnate, those of others entire. They are generally small palms, some of them very small, and with slender stems; that of *B. tenuis* is not thicker than a goose-quill. Some are spiny, and form thickets not easily traversed. *B. acanthocarpa* is called TUCUM, near Bahia, and from it an extremely tough thread is obtained, which is used for making nets. *B. maraja*, the MARAJA palm, produces large clusters of fruit, resembling small grapes, with a thin pulp of an agreeable subacid flavor.

BACTRITES, a genus of fossil *ammonitidæ*, with a straight shell, and indented but not ramified septa. Five species have been described, all from Devonian strata.

BA'CULITES, a genus of the family of *ammonitidæ*, differing from the true *ammonites* (q.v.) in the perfectly straight form of the shell, which tapers to a point, and is either round or compressed. The species, like the other ammonitidæ, are all fossil. B. are characteristic of the upper chalk, and appear to have existed only towards the expiry of the period over which the existence of the ammonitidæ extended.

BA'CUP, a rapidly increasing and very prosperous t. of Lancashire, and station of the East Lancashire railway, situated in a beautiful valley near the borders of Yorkshire, 15 m. n. from Manchester, and 12 m. e. by s. from Blackburn. Great improvements have been and are still being made in the condition and appearance of the town. There are many churches of all denominations, a mechanics' and a literary institute, reading-rooms, etc., and in Aug., 1867, was opened a beautiful market-house. The pop. was 6981 in 1851, and 17,199 in 1871. B. has extensive cotton factories, dye-works, brass and iron foundries. There are numerous coal-mines in the neighborhood; and within a mile from the town, large woolen manufactories.

BADA'GRY, a seaport t. on the gold coast of upper Guinea. Pop. 10,000. At one time it carried on a large trade in slaves with the Portuguese, who here established several factories. B. now belongs to Great Britain. It was from this place that Lander and Clapperton started on their expeditions to explore the African interior.

BADĀJOZ', called by the Romans Pax Augusta, and by the Moors Beledaix, i.e., "Land of Health," is the capital of the Spanish province of the same name. It is situated about 5 m. from the borders of Portugal, in a fruitful district on the left bank of the Guadiana, which is here crossed by a stone bridge of 28 arches. It has 22,195 inhabitants, is a fortress of the first rank, the residence of a captain-general, and the see of a bishop, and has an old cathedral with a splendid organ, and paintings by Mateo Cerezo and Morales, who was born at B.; a brisk traffic, chiefly contraband, is carried on with Portugal. Its chief articles of manufacture are soap, coarse woolens, leather, and delft-ware. As one of the keys of Portugal, B. has often been a place of importance in war. It was besieged in vain by the Portuguese in 1660, and again by the allies, in the Spanish war of succession, in 1705. During the French war, B. was besieged by the French in 1808 and in 1809, and again in 1811, when it surrendered, Mar. 11, to Soult. It was thrice besieged by the English under Wellington: first on April 17, 1811, after the conquest of Olivenza, on which occasion, the approach of Soult to its relief caused the siege to be raised on the 14th of May; the second time, after the battles of Fuentes d'Onor and Albuera, the city was invested from May 27 to June 10, 1811, but still in vain. The third investment, Mar. 17, 1812, ended in the taking of the city by storm, on the night of April 6, after a murderous contest, and a loss, during the twenty days' siege, of 72 officers and 963 men killed, and 306 officers and 3483 men wounded.—The province of B. has an area of 8687 sq.m., and a population of (1870) 431,922. See ESTREMADURA.

BADAKHSHAN', or BUDUKHSHAN', a territory of central Asia, lying between 36° and 38° n. lat., and 69° and 73° e. long. B. lies between the chain of the Hindu Kush and the Oxus. It is drained by the Kokcha, a tributary of that river, and is famous throughout the east as a picturesque hill-country covered with woods, rich pasture, and fertile and well-cultivated valleys. Eastern travelers speak with rapture of its rich orchards, its fruits, flowers, and nightingales. In recent times no European traveler has visited it except capt. John Wood, who only saw it in the winter of 1838. The inhabitants are Tajiks, or an Aryan race speaking Persian and Turkee. They are Mohammedans—Sheas in the mountains, and Sunnas in the plains. Their number is estimated at 350,000. One of their chief occupations is man-stealing—their captives being chiefly Kafirs and Chitralis from the Indian side of the Hindu Kush. The people of B. seem to have been always under the immediate rule of their own chiefs, at the head of whom was "the Mir." They have generally, however, formed part of some great Asiatic empire. In the last century, B. formed part of the empire of Nadir Shah, after whose death it became subject to the Afghans. In 1823, however, the Uzbecks, under Murad Beg, taking advantage of the disturbed state of Afghanistan, defeated the tribes of B. in a pitched battle; and two years after, their subjection was completed. Their conquerors treated them most harshly, demolishing their towns, and either selling them as slaves, or carrying them off to people the unhealthy swamps of Kunduz. On the death of Murad in 1845, B. seems to have become for a time independent. The Afghans, however, soon reasserted their claims. In 1859, they conquered Kunduz, and were about to annex B., when the Mir agreed to pay an annual tribute. In 1863, Jehandar Shah, the Mir of B., was superseded by Mir Mamud Shah, another of the royal family of B., supported by the Afghans. This gave rise to a struggle which ended in the nephews of Jehandar acquiring dominion by means of Afghan help. In 1873, England and Russia discussed and agreed upon a frontier between B. and Afghanistan.—B. is sometimes made to include Wakan, on the upper Oxus, between B. proper and the Pamis Steppe (see BOLOR).—See Yule's *Marco Polo;* Vambéry's *Central Asia*, 1874; *Quarterly* and *Edinburgh Reviews*, 1873.

BADAR'KA, a t. of Oude, India, in the district of Bainswarra, 4 m. e. from the Ganges, and 5 m. e. from Cawnpore. Pop. 8000.

BADDECK, a village and capital of Victoria co., N. B., dominion of Canada, on the island of Cape Breton, accessible to steamers.

BAD'DERLOCKS, or HENWARE (*alaria esculenta*), a sea-weed (see ALGÆ), of the sub-order *fucaceæ*, growing on rocks in deep water on the shores of Britain, Iceland, and the northern parts of Europe. It has a stem 4 to 8 in. long, pinnated with a few short leaflets, which contain the seeds, and a membranous olive-green frond of 2 to 12 ft. long, with a stout mid-rib. The frond being stripped off, the mid-rib forms an article of food to the inhabitants of the sea-coasts of Iceland, Denmark, Scotland, Ireland, etc. The thinner part of the frond is also sometimes eaten.

BADEAU, ADAM, a native of New York; served on Sherman's staff, and was wounded at Port Hudson, in the rebellion. He was gen. Grant's military secretary, was brevetted as brig. gen. of the U. S. army, and was secretary of the American legation in England. He is the author of *Military History of Gen. U. S. Grant.*

BA'DEN, THE GRAND DUCHY OF, is situated at the south-western extremity of the German empire. With an area of 5900 sq.m., it runs in the direction of the valley of the upper Rhine and of the Black Forest, from the southern bend of the Main at Wertheim to the Bodensee or lake of Constance, and is bounded on the n. by Bavaria and Hesse-Darmstadt; on the e. by Hohenzollern, Würtemberg, Bavaria; and on the w. and s. by the Rhine, which separates it from Rhenish Bavaria, Alsace, and Switzerland. It is divided politically into four circles—the circle of the "Lake," at the s., and the circles of the "Upper Rhine," of the "Central Rhine," and of the "Lower Rhine;" these are again divided into 79 districts.

Surface and Hydrography.—Physically, B. falls into two divisions—the western plain, lying along the right bank of the Rhine, and the eastern highlands; the plain occupying about a fifth of the whole duchy, and the hilly part, four fifths. Of the mountain-ranges, the Schwarzwald, or Black Forest, is the most prominent. See BLACK FOREST. For a distance of 96 m., it belongs almost exclusively to Baden. It terminates in abrupt declivities towards the w., and on the e. descends by degrees into the plateau of the Neckar in Würtemberg. It decreases in height from s. to n., its mean elevation being from about 4000 to 2700 ft., and is cut up into sections by numerous deep and wildly romantic valleys. The most remarkable summits are Feldberg and Belchen in the south. The less elevated part of the mountainous division of B., which lies to the n. of the Murg, receives the general name of the Neckar highlands, as far as to its intersection by the Neckar valley, on the n. side of which the Odenwald begins. Southward, in the circle of the "Lake," rise the extensive plateaus of the German Jura. This table-land is known by the local name of the Randen. In the plain of the "Upper Rhine," between Altbreisach and Endingen, stands the small isolated basaltic group of the Kaiserstuhl, or emperor's seat, rising to the height of 1100 ft., and overlooking the Rhine.

Being drained by the Rhine and the Danube, B. belongs to the basins of two oppo-

site seas; the sources of the Danube, however, drain only about 336 sq.m. in the northern part of the "Circle of the Lake." Beginning with the Bodensee, which projects three arms or bays on the n.w. into B., the Rhine, in its tumultuous course, forms the s. boundary, interrupted, however, by several encroachments of the Swiss territories upon its n. bank. From Basel to below Manheim, the stream is the only and natural boundary. The chief tributaries of the Rhine, on the B. side, are the Neckar, the Kinzig, the Murg, the Elz, the Dreisam, and the Pfinz. On the n.e. the B. den territories are bounded by the Main, which there receives the Tauber. Except a part of the Bodensee, B. has no lake of importance. In the Schwarzwald, however, there are the following sheets of water which go by the name of lakes: Mummelsee, Wildsee, Feldsee, Titisee, and the Nonnenmattweiher, with a floating island.

Climate.—As the difference between the highest and lowest poinst of B.—Feldberg, which rises to height of 4860 ft., and Manheim—amounts to something like 4500 ft., there is naturally a great variety of climate, especially in respect of temperature. The mean temperature of the plains may be stated at 50°, and that of the highlands at 44° Fahr., so that the Rhine valley of B. is one of the warmest and most fruitful districts, not only of Germany, but of Europe; the land yielding often, in the case of maize, a return of more than 300 fold. Walnuts, cherries, apples, and pears grow in abundance, while the western terraces of the Schwarzwald are decked with vines. On these charming declivities, the walnut thrives at a height of 1340 ft., the grape at 1450 ft.; other kinds of fruit are cultivated in the higher regions to an elevation of more than 2000 feet. The wild cherry is found even as high as 2600 ft.; the cereals being profitably cultivated to at least an equal height. Oats rise as high even as 3600 ft., above which lie the exclusively pastoral districts.

About two thirds of the population are engaged in the cultivation of the land, which, as may be inferred from the description, yields rich returns. An area of about 3200 sq.m. is occupied with fields and gardens, growing wheat, oats, rye, barley, maize, potatoes, pulse, and vegetables of all sorts. Tobacco, hemp, rape, opium, etc., yield a large revenue. Meadow-land and pasturage occupy about a fifth of the surface. An important branch of cultivation is also the production of chestnuts, walnuts, almonds, etc. The quantity of wine produced yearly is, on an average, 14 million gallons. About 1790 sq.m. are under wood. The Schwarzwald is one of the most remarkable pine-forests of Germany. There whole tracts may be seen of pines of the height of from 160 to 180 ft., which are exported to the Netherlands for ship-building. The rearing of cattle is carried on to a large extent. The several kinds of stock may amount to the following numbers: horses, 73,200; asses, 700; cattle, 481,000; sheep, 189,000; goats, 22,100; swine, 480,000; making a total of 1,246,000 head of animals, and representing a large amount of wealth. Honey is also an important product, more than 74,000 beehives being kept in the duchy. Various societies exist for improving the breed of horses and perfecting agriculture.

Minerals.—The mineral wealth of the country does not seem to be valued yet as it deserves, if we may judge from the extent of mining operations carried on; but the activity of the mining society at Carlsruhe is yearly bringing this department of the national industry more and more into a fitting condition. Iron, lead, silver, copper, and salt are among the chief productions; gold is extracted from the sands of the Rhine, near Wittenweier, and cobalt, sulphur, marble, and several kinds of precious stones are found. B. is rich in mineral springs; as many as 60 are enumerated, some sulphureous, some chalybeate, and some acidulous. Hence there are a great number of much frequented watering-places, as Baden-Baden, Badenweiler, Griesbach, Petersthal, etc.

Manufactures, etc.—The increasing activity in the various branches of industrial art is testified by the existence of over 1200 manufactories, with about 70,000 hands, and a yearly produce of from 40 to 50 million marks. The industrial activity extends chiefly to the following articles: ribbons and cotton fabrics, mostly at St. Blasia; toys and trinkets, and tobacco, which occupies the first place; chicory, paper, cloth, leather, beer, wooden clocks, and articles of straw; the last two are characteristic of the Schwarzwald districts, and known all over the world. Of clocks alone, over 600,000 are made annually. The chief articles of export are wine and timber, which last is sent almost exclusively to the Netherlands, and brings in a sum of at least 6,000,000 marks (£300,000). The principal imports are colonial goods, fruits, drugs, horses, wool, cotton, silk goods, iron, steel, and articles of luxury. Money was formerly reckoned in guldens or florins of 24 to the mark of silver, a florin being equal to 20*d.* sterling; but now, under the new universal system of the German empire, in marks, approximately equal in value to shillings. Weights and measures are divided according to the decimal system.

Population, Religion, Education.—The pop. of B. in 1875 amounted to 1,506,531, being an increase of above 40,000 as compared with 1871. With the exception of Jews, the inhabitans are exclusively German. The dominant church is the Roman Catholic, whose adherents in 1871 numbered 942,560, or about two thirds of the whole population. Protestants numbered 491,008; Dissenters and Mennonites, 2265; and Jews, 12,475. The school-system of B. is excellent; it offers the means of instruction to every individual; and a multitude of libraries, museums, and collections of all sorts, are significant indications of the higher elements of culture.

Government.—The sovereignty of the grand duchy, which is strictly indivisible and

inalienable, is hereditary in the eldest of the male line, and, failing that, of the female. The heir-apparent is styled hereditary grand duke, and the other sons and daughters are called margraves and margravines. The sovereign is bound down by a parliamentary constitution. The parliament, which meets regularly every two years, consists of two chambers. The first chamber consists of the princes of the grand-ducal house, the heads of the seignorial families (7 princes and 3 counts), and of the nobility—on whom, when they possess hereditary property, under feudal tenure, to the value of 500,000 marks, the king confers the rank of the high nobility—the Catholic archbishop and the Protestant prelate, 2 representatives of the universities, and 8 members chosen by the grand duke, without regard to rank or birth. The second chamber consists of 63 representatives chosen for 8 years, 22 for the cities, and 41 for the country districts, giving 1 representative for about 21,540 inhabitants. As to the franchise, less regard has been paid in B. than elsewhere to the property qualification; every settled citizen and all state officials may take part in the nomination of electors, and may become electors; only representatives must either pay tax on a capital of 16,000 marks, or about £800, or be in possession of an ecclesiastical or secular office bringing in at least 2500 marks, or £125. The highest deliberative and executive body in the country is the council of state. The grand duke is its president, and it is divided, since 1870, into the ministeries—(1) of the grand-ducal house, of justice, and of foreign affairs; (2) of the interior; (3) of commerce. The expenditure, according to the budget estimates for the year 1875, was 30,200,813 marks; the estimated net receipts for the same year amounting to 29,896,478 marks. There is a particular budget dealing with the finances of the railways, and the steamers on the lake of Constance. 26½ millions of florins were added to the public debt of the country by the events of 1848 and 1849. The general debt of B. in 1875 amounted to 91,369,656 marks; that on the railways to 265,051,973 marks. The military affairs of B. are now exclusively regulated by the imperial power; the troops of B. form the major part of the 14th corps d'armée of the empire. The effective war-strength of the army in 1868 was 43,705; peace, 14,263. There exists three orders of knighthood, besides a medal for military service, and other decorations of merit. The capital and residence of the sovereign is Carlsruhe; the capitals of the four "circles" are Constanz, Freiburg, Carlsruhe (formerly Rastadt), and Manheim.

History.—The original inhabitants of B. were Alemanni. These fell under the dominion of the Franks, the conquerors of Gaul, and submitted at the same time to the Christian religion. Under their duke, Gottfried, they made repeated attempts to regain their independence, but in vain; and the dukedom of the Alemanni was abolished in 748 by Pepin the Little. In the 11th c., a duke Berthold, said to have been a descendant of the Alemannian Gottfried, built the castle of Zähringen in Breisgau, and with him begins the unbroken line of the princes of the house of Zähringen. A descendant of his second son took the title of margrave of B., and became the ancestor of the still flourishing house of Baden. He died in 1130. The history of this house presents, for long, little else but a succession of partitions of the territories among brothers, to be again and again reunited by one or other of the collateral branches becoming extinct. The prosperity of the country was thus greatly retarded. The present capital, Carlsruhe, was built in 1715 by the reigning count, Charles III. It is to his grandson, Charles Frederic, who succeeded in 1746, that B. owes considerable accessions of territory and political importance. By favoring the policy of Napoleon and joining the confederation of the Rhine, he doubled his possessions in extent and population, and acquired successively the dignity of elector and the title of grand duke. In 1811, he was succeeded by his grandson, Charles Ludwig Frederic, who, five years before, had married Stephanie Louise Adrienne Napoleone, an adopted daughter of Napoleon. After the battle of Leipsic, Charles Ludwig seceded from the confederation of the Rhine, and (1815) joined the German confederation, in which B. holds the seventh rank.

The original constitutions or "states" of the separate territories composing the grand duchy having mostly become extinct, the grand duke Charles granted (1818) the charter which forms the basis of the present constitution. Charles was succeeded in the same year by his uncle Ludwig, who was inclined to absolutism, and had to contend at first with a powerful opposition, which led him frequently to dissolve the chambers. He succeeded, in 1825, in carrying through an alteration of the constitution, extending the duration of the parliaments; after which the government and the chambers acted more harmoniously. Ludwig dying childless (1830), was succeeded by his brother Leopold. The known liberal tendencies of this prince promised at first a new life to constitutional government; but the tide of reaction, become strong since the fall of Warsaw, soon seized the government, and the act establishing the freedom of the press, which in 1831 had been hailed with delight by B. and the whole of Germany, was, in 1832, declared impracticable, and abrogated. A fluctuating contest between a reactionary government and a growing opposition was carried on till 1846, when the constitutional Bekk was made minister of the interior, and liberalism thus placed at the helm. The first effect was to calm the public mind, and to cause a split between the liberals and the radicals. The ninth parliament met (Dec., 1847) under the most friendly and promising auspices; when the French revolution (Feb., 1848), the vibrations of which were first felt by B., suddenly called the radical party into the most violent activity. Not satisfied with a multitude of liberal measures passed by the legislature, the revolutionary leaders, Hecker

and Struve, aimed at establishing a republic, and stirred up an insurrection. The troops having sided with the insurgents, the grand duke fled, and a constituent assembly was called (May, 1849). The duke had recourse to Prussian aid, and, after several battles, was reinstated on his throne (July, 1849). The restoration was followed by some 30 executions, consisting chiefly of soldiers that had borne arms against the government, and of a few political leaders. Upon the whole, the reactionary tendency has been less marked in B. than in most other German states, and many valuable reforms effected in 1848 have been retained. See GERMANY.

BA'DEN, a t. and fashionable watering-place in the canton of Aargau, Switzerland, is situated on the left bank of the Limmat. It has a pop. of (1870) 3412. It is of ancient date, being known to the Romans as *Thermæ Helveticæ*. The temperature of the baths is as high as 117° Fahrenheit. B., from the 15th to the beginning of the 18th c., was the seat of the Swiss diet.

BA'DEN-BA'DEN, a town in the grand duchy of Baden, situated in a pleasant valley at the base of the Black Forest. It contains (1875) 10,958 inhabitants; but its visitors during the season, which is at its height in July and Aug., are often double the number of the settled population. It is chiefly celebrated for its medicinal springs, which were known in the time of the Romans. B. having been a fashionable place of resort so early as the days of Antoninus and Aurelius, numerous Roman antiquities have been found in the neighborhood, and are preserved in a museum here. There are several springs of a saline character, varying in temperature from 117° to 154° F. These springs are impregnated with iron, magnesia, and lime, with sulphuric and carbonic acid, and are especially recommended in chronic cutaneous diseases, gout, rheumatism, etc. The chief spring discharges in 24 hours about 4200 cubic ft. of water. The gaming-tables of B., the most renowned in Europe, were closed with the rest of the licensed German gaming-houses in 1872.

BA'DEN BEI WIEN (i.e., "Baden near Vienna"), a much frequented watering-place of lower Austria, about 15 m. s.s.w. of Vienna. It was the *Aquæ Pannoniæ* or *cethiæ* of the Romans, and is still famous for its warm mineral springs, which are frequented during the season by from 12,000 to 15,000 persons, chiefly from the Austrian capital. The temperature varies from 90° to about 99° F. The baths are frequented by persons of both sexes, who, in the bath, promenade arm in arm. Many of the Austrian nobility have palaces here. The favorite walk in the neighborhood is along the romantic valley, the Helenenthal. Pop. '69, 7590.

BA'DENOCH, a highland district in the s.e. part of Inverness-shire, 30 m. long by 15 broad, bounded by Lochaber, Athole, Braemar, and Murray, and traversed by the Spey. It is much covered with forest, and is chiefly composed of gneiss rock, with a little granite. It was a lordship, held during the 13th c. by the eldest branch of the great house of Cumyn, on whose forfeiture Bruce bestowed it on his nephew Randolph. In 1371, king Robert II. gave it to his son, "the wolf of Badenoch," on the failure of whose descendants it reverted to the crown, which, about 1456, granted it to the earl of Huntly.

BADGE, the term by which, in general, all honorary decorations and special cognizances are known. Badges are either conferred by the state or sovereign, or assumed by the individual for purposes of distinction, the former class having very frequently had their origin in the latter. Of badges conferred by public authority, for the purpose of inciting to exertion, and gratifying honorable ambition, numerous instances are to be met with in every part of the world. The garter of the English knight, the golden fleece of the Spanish grandee, and the button of the Chinese mandarin, will occur as familiar examples. To the same class belong not only the stars and crosses with which princes and other persons of rank are adorned in this country, and to a far greater extent on the continent, but the medal of the private soldier, and even those not less honorable decorations which are now frequently conferred by private societies for acts of voluntary daring, such as the medal given by the humane society for saving from drowning. Amongst the ancients, one of the most usual emblems of authority was a gold ring, which was worn generally on the fourth finger. A ring of this description was the mark of senatorial and magisterial dignity, and latterly of knighthood at Rome; iron rings, during the earlier period, at all events, having been used by private citizens. The right of wearing a gold ring (*jus annuli aurei*) was gradually extended, till at length Justinian conferred it on all the citizens of the empire. In the early times of the republic, when ambassadors were sent to foreign states, they were furnished with gold rings, which they wore during their mission as badges of authority. From an early period, every freeman in Greece appears to have used a ring, though the custom, not being mentioned by Homer, can scarcely have belonged to the earliest period of the history of that people, and is commonly supposed to have been of Asiatic origin. Rings are often mentioned in scripture as badges of authority both amongst the Jews and other oriental nations. We read of Pharaoh taking off his ring and putting it on Joseph's hand, as a token of the power which he committed to him (Gen. xli. 42); and still earlier (Gen. xxxviii. 18), Judah left his signet with Tamar as a pledge. In the New Testament, rings are spoken of rather as marks of wealth and luxury than as badges of official rank; e.g., James ii. 2. and Luke xv. 22, where, on the return of the prodigal son, the

father ordered that a ring should be put on his finger. As to the workmanship and materials of ancient rings, see RING, SIGNET, etc. Of badges assumed for the purpose of distinction, none are more famous than the white and red roses of York and Lancaster. Henry VII. combined these two emblems, first carrying a rose per pale, white and red, and afterwards placing the white rose within the red one. One of queen Elizabeth's badges was a golden falcon perched on the stump of a tree between two growing branches of white and red roses, a B. which is said to have been given to her mother, Anne Boleyn, by Henry VIII. The *bear and ragged staff*, which still exists as a sign in London, was the B. of the great earl of Warwick. The *white hart* and *silver swan*, which are frequently met with as signs to inns, have a similar origin, the first having been the B. of Richard II., and the second having belonged to the house of Lancaster. The *garb and sickle*, the B. of the Hungerfords, is another very beautiful and less common example of the same class of badges. Different countries have also distinctive badges, generally connected with the history either of the actual ruling or of some former dynasty. Of these, the *fleur de lis* of France, and the other badges, for which it from time to time makes way—viz., the cap of liberty and other emblems of republicanism, the eagles of the empire, borrowed from Rome, and the bees and other insignia which the Bonaparte family have assumed, may all be taken as examples.

B. of England.—The present B. of England is a rose white and red, ensigned with the royal crown. The initials V. R., ensigned with a crown, which are used on military accouterments, is also a species of national badge.

B. of Scotland is a thistle ensigned with a royal crown.

B. of Ireland.—Ireland has two national badges—the golden harp and the trefoil, both of which are carried ensigned with the royal crown.

The three badges of England, Scotland, and Ireland, carried conjoined, may be seen under any representation of the royal arms.

B. of Wales is a dragon passant, wings elevated, gules, on a mount vert.

B. of Ulster is on a shield or canton, *or*, a sinister hand erect and apaumée, *gu.* This B., which is popularly known as "the bloody hand," is borne in the paternal coats of English baronets.

B. of Nova Scotia, which is borne by the Nova Scotia baronets, is, *or*, a saltire *azure*, thereon an escutcheon of the arms of Scotland, and ensigned with an imperial crown, the motto being, *Fax mentis honestæ gloria.*

One of the oldest and most celebrated badges in existence is the so-called jewel of king Alfred. For the badges of the different orders of knighthood, see their respective titles.

BADGER, *Meles*, a genus of quadrupeds of the bear family or *ursidæ* (see BEAR), and included by Linnæus in the genus *ursus* or bear, but forming a sort of connecting-link between this family and the *mustelidæ* or weasel and otter family. To the skunks (q.v.), which are ranked in that family, the badgers have a particularly strong resemblance, and their dentition and habits are almost the same. The dentition of badgers differs from that of bears chiefly in the large size of the tuberculous molar teeth at the bottom of each jaw, showing a still greater adaptation to vegetable food. Badgers, like the rest of the family to which they belong, are plantigrade, i.e., they walk on the whole sole of the foot, and not merely on the fore part of it. The body is thus brought nearer to the ground than it otherwise would be from their length of limb. The head is long, with a pointed muzzle, the tail short, the skin very thick and tough, the hair long. The gait is slow, the habits nocturnal and solitary. There are five toes on each, both of the fore and hind feet, and the feet are peculiarly adapted for digging and burrowing. A peculiar characteristic of the badgers, not found in any other quadrupeds of the same family, is the possession of a bag, beneath the tail, for the secretion of a peculiar substance, of a disagreeable odor, which is supposed to be of use in directing the sexes to each other in their solitary wanderings.—The common B. (*M. taxus* or *M. vulgaris*) is the only quadruped of the bear family now found in the British islands. It is widely diffused over Europe and the middle parts of Asia. It is grayish brown above and black beneath; the head white, with a longitudinal black band on each side; the body long but robust, in size about equal to that of a small fox, the hair coarse and reaching to the ground as the animal walks. The average length is 2 ft. 6 in., and the height at the shoulder 11 inches. It haunts the gloomy recesses of woods, or thick coppices on the sides of hills, and digs for itself "a deep and well-formed domicile, consisting of more than one apartment, the single entrance to which is by a deep, oblique, and even tortuous excavation." In this, or similar excavation, the B. sleeps through the winter. The B. makes use of its nose in digging, scrapes with the fore-paws, flinging the earth as far back by them as possible, and, when the accumulation is considerable, pushes it away by means of the hind-feet. The B. is extremely cleanly in its habits. It is one of the most perfectly omnivorous of animals, in a wild state as well as in confinement; fruits, roots, beech-mast, eggs, young birds, small quadrupeds, frogs, snails, worms, and insects, equally constitute its natural food. It has been known to visit a garden for strawberries. It is also fond of honey, and of the larvæ of wasps and wild bees, for the sake of which it digs up their nests, its hide being impervious to their stings. It is often caught by placing a sack in the mouth of its hole, when it is out at

night; dogs are then sent into the wood to alarm it, upon which it flees to its hole. Dogs sent into the hole are often foiled by earth which the B. throws back upon them to block up their way; nor is it easy for a dog to contend with it, owing to its great strength, and particularly the strength of its jaws. A barbarous sport was formerly, and to some extent still is practised, called B.-baiting, or *drawing the badger*. A B. kept in a barrel was assailed by dogs, and at last, yielding to superior numbers, was dragged out, upon which it was released and allowed to go back to its den, to recover itself, and be baited again, which happened several times daily, when the B. was kept as an attraction to a public-house of the lowest sort. The verb to *badger*, expressive of persevering annoyance by numerous assailants, was originally employed with reference to the practice of B.-baiting. The flesh of the B. is said to be very agreeable, particularly when cured in the form of hams. It is much used in China. The B. is easily domesticated when taken young, and becomes very familiar. In Scotland and the north of England, a B. is still called a *brock*, its Anglo-Saxon name; and in some parts of England it is termed a *gray*, from which some derive grayhound.—The balysaur of India, also called the sand bear and Indian B. (*M. collaris*), very much resembles the common B., but is taller, and has a more hog-like muzzle, and a longer tail. Its habits and its food are similar to those of the common B., and, when attacked, it defends itself with great vigor. It is chiefly found in hilly districts.—The American B. (*M. Labradorica*) was at first supposed to be a mere variety of the European B., but has proved to be very distinct, so that it has been regarded by some naturalists as worthy of a separate genus (*taxidea*), and is sometimes called *taxel*. Its teeth are more adapted than those of the B. for carnivorous subsistence, and it chiefly preys on small animals, such as marmots, which it pursues into their holes in the sandy plains near the Missouri and the Rocky mountains. It is in that region that it abounds, over a considerable range of latitude, but it is not known to exist in Labrador, so that its specific name is perhaps the perpetuation of an error. In its pursuit of the smaller quadrupeds upon which it preys, it enlarges their burrows, and renders some parts of the plains dangerous to persons on horseback. Its prevailing color is hoary gray in winter, yellowish brown in summer, the under parts generally yellowish white; a white stripe runs from the nose over the forehead to the neck. The hair becomes not only very long but woolly in winter.—The burrowing powers of this animal are extraordinary. It sometimes makes burrows 6 or 7 ft. deep, running under ground to a length of 30 feet.

BADGER, Milton, D.D., 1800–73; a native of Connecticut, a graduate of Yale, and in theology at Andover; pastor of a congregational church there; officially connected as secretary with the American home missionary society for 38 years, in which responsible relation he was noted for wise and faithful service.

BADI'A-Y-LEBLICH, Domingo, known also by the name Ali-Bei-el-Abbassi, one of the most enterprising of modern travelers, was b. at Barcelona, April 1, 1767. He studied the Arabic language, and also physical science and mathematics at Valentia. Possessed of a lively and restless spirit, he formed the project of visiting Africa and Asia, under the disguise of a Mussulman, both for the purpose of avoiding the suspicions of the natives when visiting those places forbidden to Christians, and also for giving greater *éclat* to his adventures. In pursuance of this scheme, therefore, he resigned an office under government in the year 1797, and went to Madrid, to make proposals of a scientific and mercantile tour of exploration in Africa. Having gained promises of support from Don Godoï, the prince of peace, he betook himself for a short time to London, to study commerce and politics. He also spared no labor to make himself familiar with the manners and customs of the people he was about to visit; and in his anxiety to escape detection, he even ventured to undergo the severe ordeal of circumcision. In 1803, he sailed for Africa, where he represented himself, under the name of Ali-Bei, as a descendant from the Abbasides. His tact and talents gained for him such esteem that he was invited to the court of the Emperor of Fez and Morocco. After a two years' residence in Morocco, he set out on a pilgrimage to Mecca in 1805, and after sojourning some time in Tripoli, Cyprus, and Egypt, arrived at the holy place in 1807, being the first Christian that had visited it since the institution of Islam. Subsequently, he visited Jerusalem and the chief places in Palestine and Syria, and in the autumn of 1807 arrived at Constantinople, whence he had soon to flee, the reality of his Mohammedanism being suspected. After his return to Spain, he was made intendant of Segovia and prefect of Cordova; but the easy way in which he shelved his patriotism, and submitted to the French conquerors, was fatal to his prospects, for, on the expulsion of the latter, he was compelled to leave the country. He went to Paris, where, in 1814, he published an account of his travels under the title *Voyages d' Ali-Bei en Afrique et en Asie pendant les Années* 1803 *à* 1807. His work was translated into most of the European languages. Four years after the publication, B. set off on another journey to the east, but died suddenly at Aleppo on 30th Aug., 1818. The Pasha of Damascus seized his papers, so that his second enterprise has been without results for Europe.

BADIUS, Jodocus, or Josse, 1462–1535; an eminent painter in Paris, who previously studied at Brussels and Ferrara, and for several years taught Greek at Lyons. He illustrated and printed several of the classics, and produced a life of Thomas à Kempis, and a satire on the follies of women, called *Novicula Stultarum Mulierum.*

BADMINTON, a popular game closely resembling lawn tennis, is played with battledore and shuttlecock on a rectangular portion of a lawn. The ground is divided crosswise by a strip of net, not less than 3 in. wide, suspended from poles at a height of 5 feet. As in lawn tennis, the ground on either side of the net is divided lengthwise into right and left courts. The first player standing on a specified part of his right court, must strike the shuttlecock so as to fall across the net into the back section of the right court opposite. The opponent strikes it back, then it is returned by the first player, and so on till the first player misses the shuttlecock. After the first stroke it suffices that the shuttlecock be sent across the net, if it does not fly beyond the boundaries.

BADRINATH. See BHADRINATH, *ante*.

BAEL, or BHEL. See AEGLE.

BAËNA, a t. in the province of Cordova, Spain, of about 12,000 inhabitants. It is situated about 24 m. s.s.e. from Cordova, on the river Marbella, and carries on a considerable export and inland trade, chiefly in grain and oil. B. was a Roman town; and a Roman sepulchre was discovered here in 1833.

BAER, KARL ERNST VON, a distinguished Russian naturalist, was b. Feb. 29, 1792, in Esthonia. During 1810–14, he studied medicine at the university of Dorpat, but convinced that Russia as it then was presented very few advantages for the acquisition of scientific knowledge, he went to Germany in 1814, where he studied comparative anatomy under Döllinger in Würzburg. He also made the acquaintance of prof. Nees of Esenbeck, who exercised a considerable influence over him. In 1817, he went to Königsberg, where, two years after, he was appointed professor of zoology, and charged with the organization of the zoological museum. In 1834, he was called to St. Petersburg, and was soon known as one of the most active members of the academy (of which he became an honorary member in 1862). As a naturalist, he has specially occupied himself with the difficult subject of embryology; and to his laborious investigations we owe several most valuable discoveries in regard to the development of organic bodies. Beginning with his *Epistola de Ovi Mammalium et Hominis Genesi* (Leip. 1827), he still further elucidated this subject in his *History of Animal Development* (Königsberg, 1828–37) and *History of the Development of Fishes* (Leip. 1835). After his return to St. Petersburg, he made the polar regions the objects of his study. He examined carefully the northern shores of Russia, and published a minute description of their fauna and flora. He suggested valuable improvements in the Russian fisheries. In 1864, the 50th year of his doctorate was celebrated by the Esthonian nobility, at whose expense a splendid volume was published, containing B.'s autobiography. He d. Nov. 29, 1876. His *Reden* and *Kleine Aufsätze* appeared in 1864–75; the *Beiträge zur Kenntniss des Russichen Reichs* (26 vols.) in 1864–75.

BAEZ, BUENAVENTURA, b. 1820; president of the republic of San Domingo and thrice re-chosen. He was the son of a mulatto, inherited a large fortune, and was prominent in securing Dominican independence. In 1853, he was driven from the country by Santana; returned in 1856; was again driven out in Jan., 1858; again returned in 1865, and was elected for the third time. The next year an insurrection drove him into exile; and in the following year he was again restored. B. endeavored to secure the annexation of Dominica to the United States, but the U. S. senate declined the offer.

BAE'ZA, a handsome old t. of Spain, in the province of Jaen, from the capital city of which it is about 22 m. distant in the n.e. direction. Pop. about 12,000. It was here that the younger Scipio routed Asdrubal with immense loss, taking 10,000 Spaniards prisoners. It was a flourishing city under the Moors, several of whose caliphs and kings resided here, but it never fairly recovered its sack by St. Ferdinand in the 13th century. Gaspar Becerra, the celebrated sculptor, was b. here in 1720; but B. is chiefly proud of being the birthplace of the 11,000 virgins, usually named of Cologne. Its principal buildings are the university, the old monastery of St. Philip de Neri, the cathedral, and the Jesuits' college. B. has manufactures of leather.

BAF'FA, the *Paphos* of ancient times, a seaport t. on the s.w. coast of the island of Cyprus. It has now fallen much into decay, and has but a small population, who trade in cotton, silk, and grain; but under the Venetian rule, it was a place of considerable importance. The present t. occupies the site of New Paphos, which, under the Romans, was a beautiful city, full of fine temples and other public buildings. The Old Paphos, famous as the place where Venus landed immediately after her birth from the foam, and as her favorite residence, stood a little to the south-east. A hundred altars were here erected to her name, to which numerous worshipers, male and female, from New Paphos, trooped annually to pay their devotions. An earthquake in the time of Augustus destroyed the Roman Paphos, but it was rebuilt soon afterwards. The Roman deputy-governor, Sergius Paulus, was here converted by St. Paul.

BAFFIN, WILLIAM, 1584–1621; an English navigator of whose early life nothing is known. In 1612, he accompanied James Hull in his search for a north-western passage, and in 1613, commanded the English whaling fleet in the Arctic seas. In 1616, he went north in the *Discovery* under Bylot, and explored the inlet now known as Baffin's bay.

In 1621, he was killed while trying, in conjunction with a Persian force, to expel the Portuguese from Ormuz.

BAFFIN'S BAY, a gulf, or rather sea, on the n.e. coast of North America, extending between that continent and Greenland; lat. 68° to 78° n., and long. 51° to 80° east. It is about 800 m. long, with an average breadth of 280. Its greatest depth is 6890 feet. The tides do not rise more than 10 feet. The currents are generally towards the s., though recent investigations would seem to show that on the e. side of Davis' strait and B. B. a current from Spitzbergen flows northwards round cape Farewell. The shores are for the most part lofty and precipitous, backed by ranges of snow-clad mountains. The prevailing rocks are granite and gneiss. The principal animals inhabiting the coasts are, on land, bears, black foxes, and hares; in the sea, the black whale, walrus, and seal, gulls, ducks, and other sea-fowls. The s. shore of Whale sound on the e. coast in lat. 77° 20′ n. was found by capt. Inglefield in 1852 to be inhabited. There are Danish settlements on Disco and Whale islands. B. B. communicates with the Atlantic ocean by Davis' strait; and with the Arctic ocean by Smith sound on the n., and Lancaster sound on the west. Wellington strait, which forms the n.w. outlet of Lancaster sound, was entered in 1852 by Sir E. Belcher. B. B. was first explored in 1616 by William Baffin, after whom it was called, and who was pilot of the expedition, which was commanded by Bylot. Baffin's title to this honor seems to have been most faithfully earned; and the accuracy of his observations and descriptions has been confirmed by subsequent navigators. Whale and seal fishing are prosecuted to a large extent in B. B., which, on account of ice, is only navigable for some two months in summer.

BAFFO, a Venetian lady of singular beauty and talent, called "the pure." She was captured by pirates in 1580, and made a slave in Constantinople, afterwards becoming the sultana of Amurath III., over whom she had great influence. After his death she was the counselor of her son Mohammed III., who drowned all his father's wives except her. She died during the rule of her grandson.

BAGA'RIA, or BAGHERIA, a t. of Sicily, in the province of Palermo, 9 m. e. by s. from Palermo, with which it is connected by railway. Pop. about 12,000. It is beautifully situated at the base of the isthmus which separates the Bay of Palermo from that of Termini, and is surrounded by groups of palatial villas of the Sicilian nobility, abandoned after the proprietors had ruined themselves by the festivals here celebrated in honor of queen Caroline, at the commencement of the present century.

BAGASSE, CANE-STRAW, or CANE-TRASH, is the refuse matter obtained during the expression of the saccharine juice from the sugar-cane. In the manufacture of sugar (q.v.), the sugar-canes, in lengths of 3 to 4 ft., are passed between heavy rollers, which only partly squeeze out the juice, and yield the bruised canes, or B., still retaining a large percentage (usually about 18) of sugar.—The only use to which the B. is put is as fuel in the heating of the boilers and pans in the sugar manufactory. The improved apparatus introduced of late years has done much to save the large amount of sugar wasted in the B. and other parts of the process, which at one time amounted to not less than one half of the entire quantity of the sugar in the sugar-cane.

BAGATELLE (Fr. signifying primarily any trifle), the name of a game somewhat resembling billiards. A bagatelle-table is usually about 7 ft. long and 21 in. broad; it is lined with cloth, and a game is performed on it with balls and a cue or mace. The balls are small ivory spheres, and the sport consists in striking one or more into the holes at one end of the board. To perform this and other feats, some skill and experience are required, and the sport is far from unamusing in a cheerful parlor circle. Of late years bagatelle-tables have become very common in the houses of the middle classes of society; they possess the recommendation of being purchasable at a small expense.

BAGAUDÆ, or BAGAUDI, peasants of Gaul who resisted Roman oppression about 270 A.D., capturing and destroying Augustodunum (now Autun). Claudius temporarily repressed them, but Aurelian made concessions to them, and proclaimed general amnesty. They rose again in 294, and Maximian was sent against them. Their first leader was Victoria; subsequently there were two, Ælianus and Amandus, the latter calling himself emperor. Extant coins show that they had more than one emperor. The two last named fell in battle, and Maximian utterly defeated their forces; but they were troublesome to Rome until the end of the western empire.

BAGDAD, the name of a t. and pashalic in the s.e. of Asiatic Turkey. The pashalic extends from lat. 30° to 38° n., and from long. 40° to 48° e.; and is bounded on the n. by the pashalics of Diarbekir and Van; on the w. and s., by Syria and Arabia; and on the e. by Persia; while at its s.e. extremity lies the Persian gulf. Extreme length, 550 m.; breadth, 350. Pop. 2,000,000. It is watered by the rivers Euphrates and Tigris, which unite their streams at the town of Korna, in lat. 31° n., and long. 47° east. The pashalic of B. is usually divided into three parts. 1. That e. of the Tigris, comprehending the districts of *Khuzistan* (anciently, *Susiana*) and *Kurdistan* (part of ancient Assyria), the former of which is rich in grain and fruit. 2. That w. of the Euphrates, a sterile waste, losing itself at last in the great Syro-Arabian desert. 3. That between the two rivers, the northern portion of which is known under the name of *Algesirah*, or "the island"

(anciently, *Mesopotamia*), and the southern under that of *Irak-Arabi* (anciently *Babylonia* and *Chaldea*). The last of these divisions, though now a barren wilderness, was in ancient times luxuriantly fertile, the seat of mighty empires, and inhabited by industrious populations. The barbarous misgovernment and wretched incapacity of the Turks have reduced it to its present condition. The pashalic produces, in the better-cultivated districts, crops of rice, wheat, maize, barley, with some hemp, flax, tobacco, etc., while dates are brought to great perfection. The chief wild animals are lions—not numerous—hyenas, jackals, wolves, gazelles, ostriches; the chief domestic ones are horses, asses, mules, buffaloes, camels, and dromedaries. The inhabitants are composed of Turkomans, Armenians, Turks, Jews, Arabs, and Kurds; the last two of which races are notorious for their open and audacious depredations, their mutual wars, and their utter contempt for the authority attempted to be exercised over them. Principal cities—Bagdad, Bassora, and Mosul. For a description of the cities which in ancient times adorned this region, see ASSYRIA, BABYLON, NINEVEH, CTESIPHON, SELEUCIA, etc.

BAGDAD, the capital of the pashalic of the same name, is situated on both banks of the Tigris, in lat. 33° 20′ n., and long. 44° 23′ e. Pop. estimated at 60,000. The city is surrounded by a brick-wall, 5 m. in circumference; the two parts are connected by a bridge of boats, and the communication is guarded by a citadel. It has an extremely picturesque appearance from the outside, being encircled and interspersed with groves of date-trees, through which one may catch the gleam of domes and minarets; but it does not improve on closer inspection. The streets are narrow, crooked, unpaved, and dirty, full of ruts, and strewed with dead carcasses, which, however, are for the most part removed by dogs, the only public scavengers in the east. The exterior of the individual houses corresponds with the repulsive aspect of the streets. They have, in general, no windows towards the front, and are built of old brick; but their interior is often very gorgeously decorated. The vaulted ceilings, rich moldings, inlaid mirrors, and massive gilding, bring back to the recollection of the traveler "the golden time of good Harun Al-Raschid." B. contains upwards of 100 mosques. These, together with the khans, bazaars, and the palace of the governor, are the only noticeable buildings in the city. The domes and minarets are said to be finer than those of Constantinople, and are beautifully painted. The bazaars exhibit the produce of both Turkish and European markets; but commerce has greatly decreased since Persia began to trade with Europe by way of Trebizonde on the n., and by the Persian gulf on the south. Nevertheless, though no longer the chief emporium of merchandise between east and west Asia, and though robber Kurds and Arabs lurk on all the roads that lead from the city, B. still carries on a considerable traffic with Aleppo and Damascus, and has manufactures of red and yellow leather, silks, and cotton stuffs. The value of goods that passed through the custom-house at B., in 1874–75, was £452,498. Of the 60,000 inhabitants, the greater part are Turks and Arabs; the remainder are Jews, Armenians, Hindus, Afghans, and Persians. In summer, the heat is oppressive; rain does not fall on more than 20 or 30 days throughout the whole year; but when the snows melt on the Armenian hills, the Tigris becomes a majestic, and often a destructive river. In 1831, an inundation destroyed one half of the town, and several thousand lives. The plague visits it periodically—once every 10 years. In 1831, 4000 people perished daily for several days from its ravages! B. is frequently chosen by Mohammedans of the Shiah sect as a permanent place of residence. Several steamers now ply on the Tigris to and from B.; and here is one of the chief stations of the Anglo-Indian telegraph.

B. was founded by the Abbaside caliph Almansur, 762–766 A.D. It was built out of the ruins of Ctesiphon and Seleucia. In the 9th c., it was greatly enlarged by Harun Al-Raschid, who erected numerous edifices on the e. side of the Tigris, and connected its two banks by a bridge of boats. The palace, built for himself, and the tomb of his favorite wife, Zobeide, are said to have been of extraordinary splendor. A hundred years later, B. was ravaged by the Turks. In 1253, the grandson of Genghis Kahn, Hulaku, put an end to the old caliphate; but the descendants of this Tartar conqueror were expelled by Timur, who took the city in 1393. After several vicissitudes, it remained in the possession of a Turkoman chief, whose dynasty governed until 1470. In the beginning of the 16th c., Shah Ismail, the founder of the Suffide dynasty in Persia, made himself master of it; since which period it has repeatedly been a bone of contention between Turks and Persians. After a memorably obstinate siege, it was conquered by the sultan, Murad IV., in 1638. Nadir Shah vainly essayed to retake it in the 18th c., and ever since it has been under the sway of the porte.

BAGGAGE, in the marching arrangements of the British army, is placed under strict rules, in order that accumulation of weight may not impede the movement of the troops; and rules of an analogous kind are enforced in troop-ships, when soldiers are on a voyage. The term itself is made to apply chiefly to articles of clothing, and to small personal effects. A private soldier is allowed to carry nothing except that which his knapsack and other accouterments can hold; but those who are married with their officers' consent—a small number in every regiment—are allowed one small chest each, of definite size, which may be carried on a march, but at the men's own expense. Staff-sergeants and pay-sergeants have similar permission. The baggage-wagons are not expected to receive packages weighing more than 400 lbs. each, or as much as four men can lift.

Officers' B. is, of course, much more considerable in amount than that of the non-commissioned officers and privates. On board troop-ships, the weight to be carried for each person is strictly defined—from 18 cwt. for a field officer, down to 1 cwt. for a married private soldier, with his wife and children. In encampments, whether permanent or temporary, and in armies on field-service, the utmost care is taken to preserve the B. from the enemy, by surrounding it as much as possible with defensive troops.

BAG'GESEN, JENS, a well-known Danish poet, but who also has a place in German literature, was b. at Korsör, in the island of Zealand, Feb. 15, 1764. He first obtained a reputation by his *Comic Tales* (1785), the opera *Holger Danske* (1790), as well as by his odes and songs. Through the kind assistance of the prince of Augustenburg, he was enabled, in 1789, to make a tour through Germany, Switzerland, and France. In 1811, he was appointed professor of Danish language and literature at Kiel; in 1814 he removed to Copenhagen, where he became involved in an unseemly strife with Öhlenschläger, and in 1820 he left his native country altogether. Some years later, a home-sickness seized him, and he set out on his return, but died at Hamburg, Oct. 3, 1826. B.'s nature was a curious compound of pride and humility, love and hate, sensitiveness and reflective power, free-thinking and faith; and these conflicting qualities also appear in his poems, which possess an unfinished and inharmonious character. In 1803 appeared at Hamburg a collection of his German poems; in 1806 he published an idyllic epic, entitled *Parthenais oder Alpenreise* in twelve cantos, and written in hexameters, which greatly increased his reputation. It contains single passages of great beauty. B. possessed no lyrical talent, in spite of his warm-hearted and enthusiastic character. Only a few of his songs exhibit that simplicity and tenderness which are the essential requisites of song-writing; and, besides, they are almost all destitute of originality. Klopstock was the model whom he had in view in the composition of his odes; but he was far from reaching the level of his master. The sphere in which he shone most conspicuously was the serio-comic. His "humorous epic" (as he called it) of *Adam and Eve,* published shortly after his death, is a singular mixture of humor, pathos, levity, and earnestness. He left in manuscript a poem of a similar character on the subject of Faust. His *Poetical Works in the German Language* (Leip. 1836, 5 vols.) have been published by his son, who has prefixed to them an excellent biography.

BAGHERMI, or BAGIRMI. See BEGHARMI, *ante.*

BAGLI'VI, GEORGE, a celebrated Italian physician, b. at Ragusa, in Sept., 1669. The incidents of his life are almost entirely confined to his professional career. Originally descended from an Armenian family, he took the name of his adoptive father, who was a wealthy physician of Lucca, and who bestowed on him an excellent education. He studied at Salerno, Padua, and Bologna, and afterwards visited the principal hospitals of Italy. In 1692 he went to Rome, where he enjoyed the anatomical prelections of his friend Malpighi. Shortly after, he was appointed professor of anatomy at the college of La Sapienza, Rome, where he died in 1706. His great discovery in medical science is the system of "solidism," as it is called. Previous to the time of B., physicians had held the doctrine of Hippocrates in reference to the primary seat of diseases—viz.: that it is in the fluids. B. came to the conclusion that this was erroneous, and that the real seat of disease is in the solids. His reasons are, on the whole, sound, and the doctrine is now all but universally prevalent, though it is admitted that cases do occur in which the fluids appear to have been first affected. He published several treatises of great merit, in which his then novel views were explained. B. was very honest and independent in his judgment, and used to warn his profession against a blind adherence to mere dogmas on matters which were but imperfectly known.

BAGNA-CAVAL'LO, an inland t. of Italy, formerly belonging to the papal states, 11 m. w. from Ravenna, in the province of that name. Pop. about 3900. B. was a Roman city, called Tiberiacum, in honor of Tiberius.

BAGNACAVAL'LO, BARTOLOMMEO RAMENGHI, 1484–1542; an Italian painter, whose real name was Ramenghi, but he was called B. from the village where he was born. At Rome he was a pupil of Raphael, and worked on the decorations of the gallery in the Vatican. At Bologna he took the leading place, and did much to improve the style of the Bolognese school. His works are distinguished by rich coloring and graceful delineation. The best specimens, the "Dispute of St. Augustin," and a "Madonna and Child," are at Bologna, where he died.

BAGNA'RA, a seaport t. of south Italy, on the gulf of Gioja, 16 m. n.e. of Reggio. Excellent wine is produced in the neighborhood. Pop. 6229.

BAGNÈRES, the name of two towns in the Pyrenees, France, both well known as watering-places.—B. DE BIGORRE on the Adour, in the department of the High Pyrenees, is situated at the base of Montalivet, and at the entrance to the romantic valley of Campan. Besides its extensive bathing-houses, it has a college, a theater, a Pyrenean museum, a trades hall, and contains ('76) 7598 inhabitants. By the Romans it was known as *Vicus Aquensis* or *Aquæ Bigerronum.* It was destroyed by the Goths, but the fame of its waters survived, and is now so great that it is visited by about 20,000 strangers yearly. The tepid, warm, and hot saline springs are numerous, and are recommended for cutaneous and nervous diseases. Woolens, linens, and bareges are manu-

factured here.—B. DE LUCHON—the *Aquæ Convenarum* of the Romans—is situated in the department of Upper Garonne, and in a pleasant valley watered by the Pique. Its cold, tepid, and hot sulphurous waters are recommended in rheumatism, gout, cutaneous diseases, and paralysis. It has a pop. of ('76) 3982.

BAGNES, the convict-prisons of France. In ancient times, the severest punishment, next to death, was that of the galleys (q.v.). In 1748, these were abolished, and the convicts were employed in hard labor in arsenals and other public works; and the prisons in which they were lodged were called *bagnes,* from the Italian *bagno,* literally, a bath—a name supposed to have originated in the fact, that the slave-prisons at Constantinople contained baths, or because they stood near the baths of the seraglio. The constituent assembly of 1791 and 1792 mitigated the sufferings of convicts, and substituted for the detested name *galères,* that of *travaux publics,* to which succeeded the *travaux forcés,* of the code Napoleon. The practice of branding criminals with a hot iron was not abolished till 1832. The latest existing institutions of this class were at Toulon, Brest, and Rochefort, at which the number of convicts, in 1850, was respectively 3873, 2831, and 986. In these establishments, the labor of the convicts was turned to profitable account, and the various handicrafts were taught in the prison under the direction of overseers. The industrious and clever were enabled to earn small wages, and good behavior was rewarded with a gradual relaxation of restraint. Formerly the punishment of the galleys was inflicted for comparatively slight offenses, such as removing landmarks, begging, poaching, etc., but hard labor in the B. was reserved exclusively for such as commit crimes which seriously menace the public peace and personal safety. The number of these, however, is not less than 51. Of 7689 convicts (*forçats*) in 1850, 3070 were condemned to 5 to 10 years; 2239 to 11 to 20 years; 282 to 20 to 30 years; 41 to 30 to 40; 23 to 40 to 50; 9 to above 50; and 1965 for life. The principal crime was theft, for which 4750 had been condemned; for murder, 1027. The greater proportion of the criminals, viz. 4595, were from the rural districts; from towns, 2452; foreigners, 643; most of them were of the age between 20 and 40; and 3902 were unable to read or write. The most numerous class were husbandmen, threshers, gardeners, 1278; next, day-laborers, and *terrassiers* (navvies?) 1078. The number of pardons to convicts in 1848 was 90; in 1849, 52. In 1852, the imperial government decreed the suppression of the B., and substituted in their place deportation to Guiana. But in case any of the prisoners then in the B. might have considered deportation a greater punishment than what they were condemned to, it was resolved to give them the choice of remaining in prison or of being transported: 3000 chose transportation.

BAGNES-LE-CHABLE, a parish and village in the canton of Valais, Switzerland, on the left bank of the Dranse. The parish occupies the whole valley of the Bagne. Pop. '70, 4254. The valley was twice inundated during the 16th c.; again in 1818, when 400 cottages were swept away, and 34 lives lost.

BAG'NI DI LUC'CA (*Baths of Lucca*), a large inland village of Italy, in the province of Lucca, and 13 m. n. of the city of Lucca. Pop. of commune about 8200. It is one of the most frequented bathing-places in Italy, and is situated in one of the finest valleys of Tuscany, the valley of the river Lima, a branch of the Serchio. There are hot springs of various temperature from 96° to 136° Fahr., scattered over a limited neighborhood.

BAGNO A RIPOLI, a famous Italian bathing-place, in the province and circle of Florence, 5 m. e.n.e. from the city of Florence.

BAGNO IN ROMAGNO, a t. of Italy, in the province of Florence, and 35 m. e. by n. from Florence city, on the right bank of the Savio, not far from its source. It is a much frequented bathing-place, having hot springs of temperature 108° to 110° Fahr.

BAGNOLES, a summer resort in France, 13 m. s.s.e. of Domfront; noted for mineral springs and baths. The village is nearly 200 years old, and has recently been greatly improved and adorned.

BAGNOLO, a t. of Piedmont, in the province of Cuneo, 12 m. n.w. from Saluzzo, on the left bank of the Grana, at the foot of the Alps.—Another small t. near Brescia bears this name; also a t. in the province of Reggio, in Emilia; and a t. in the province of Lecce, in s. Italy, as well as many villages in Italy.

BAGO'AS, an Egyptian eunuch in the service of Alexander Ochus of Persia, who aided that monarch in conquering Egypt; but the sacrilegious treatment of the sacred objects by Alexander so offended him, that on his return to Persia he poisoned the king, and killed all the sons except Arses, the youngest, whom he placed on the throne. This boy soon displeased B., and was poisoned to exalt Darius Codomannus. B. tried to dispose of the last named by poison, but was detected and poisoned himself about 336 B.C.

BAGOT, a co. in the central part of the province of Quebec, Canada, e. of Yamaska river, intersected by the Grand Trunk railroad. Black limestone and copper are among its products. Capital, St. Liboire. Pop. '71, 19,491.

BAGOT, Sir CHARLES, 1781–1843; an English diplomatist; under secretary of state in 1807; special envoy to France in 1814; ambassador to Russia in 1820, and to Holland in 1824. In 1841, he was appointed governor-general of Canada, and died in office.

BAGPIPE, a wind instrument, which, up to the 18th c., was common in almost every country in Europe, and still continues in use among the country people in Poland, Italy, Sicily, the s. of France, Scotland, etc.; but being far from a sweet-toned instrument, and limited in its range of notes, it has fallen into disuse wherever there is any pretension to musical refinement. It consists of a leathern bag, which the player inflates by blowing with his mouth through a tube. The music proceeds from three or four pipes, whose mouthpieces are inserted into the bag; the wind being forced out by pressing the bag under the arm. One of the pipes, the *chanter*, is a kind of oboe with eight holes, and is similarly handled; the others, called *drones*, sound each only one continuous low note. It is certain that the bagpipe was in use among the Hebrews and Greeks, and there are plenty of proofs that in Germany and elsewhere in Europe it was among the most favorite instruments in the 15th century.

Though fallen generally into disuse, the B. is still a popular instrument in the Highlands of Scotland, and wherever there are gatherings of Highlanders, and even of Lowland Scotch, in England and other countries. Pipers in proper costume are also attached to the Highland regiments, and in some instances pipers are retained by Scottish noblemen to play on festive occasions. Skill in playing the B. is promoted by various Highland societies, which, at periodical competitions, give prizes to the best players of pibrochs (q.v.), reels, and other airs.

BAG'RADITES, or BAGRATIDES, a royal house of Georgia and Armenia, founded by Bagrad; its members were permitted to crown the kings of Armenia. They became Christians at the beginning of the 4th century. The Bagdad caliphs made several of the B. governors of Armenia. The dynasty maintained their independence until the occupation of the country by Russia.

BAGRATION, PETER, Prince, a distinguished Russian general, descended from the noble family of the Bagradites of Georgia and Armenia, was b. in 1756. He entered the Russian service in 1783, and was trained under Suwarrow. In 1788 he was engaged at the storming of Oczakow; fought in 1792 and 1794 against the Poles; in 1799, in Italy and Switzerland; and distinguished himself in the Austro-Russian war of 1805 against the French, especially in the sanguinary engagement of Nov. 16 of that year, when, with a small body of troops, he bravely stood during six hours opposed to the superior forces under Murat, and thus enabled the Russian general, Kutusow, to reach Znaym with the main army. Subsequently, prince B. was engaged in the battles of Austerlitz, Eylau, and Friedland, and took a part in the Russian campaign against the Turks, especially in the battle of Silistria, 1809. In the campaign of 1812, he commanded the second Russian army of the west, and had the misfortune to fail in his attack on Davoust near Mohilew; but succeeded in forming a junction with the west army at Smolensk. He was, however, mortally wounded in the battle of Mosaisk, and died Oct. 7, 1812.

BAGSHOT BEDS, the lowest series of strata in the middle eocene formation of Britain. The name is derived from Bagshot heath in Surrey, where they were first examined; but, as they are more fully developed and better seen in the isle of Wight, the rocks there are now considered the typical representatives of the series. The strata are arranged into four groups: 1. The *Upper B. B.*, composed of yellow and white sands with ferruginous stains, generally unfossiliferous, though a remarkable exception exists at Whitecliff bay, Isle of Wight, where a bed contains a large number of very friable shells. 2. The *Barton beds*, consisting of colored clays interstratified with sand and loam. They are rich in fossils, chiefly the shells of mollusca, but contain also the remains of a fish and several reptiles. Here, too, the nummulite (q.v.), so characteristic of the tertiary formations, makes its first appearance in a descending order. This genus dies out with the *nummulites variolaris*, the small species found in these beds. 3. The *Bracklesham beds*, so called from their extensive development at Bracklesham bay, near Chichester in Sussex, are composed of marly clays and white sands, capped by a bed of flint-pebble conglomerate, and resting on dark carbonaceous clays. This is the most highly fossiliferous group in the series. Two species of plants have been noticed. The remains of 6 reptiles and 21 fishes have been described, besides a long list of mollusca, amongst which is the magnificent *cerithium* (q.v.) *giganteum*, so conspicuous in the *calcaire grossier* of Paris, where it is sometimes 2 ft. in length. The prevalence of genera now only known as inhabitants of tropical or sub-tropical seas, such as volutes and cowries, together with their companion lunulites and corals, makes it highly probable that a warm climate prevailed during the deposition of these strata. 4. The *Lower B. B.*, consisting of alternations of variously colored sands with gray, chocolate-colored, or white pipe-clays. The white clays contains the only fossil organisms found in this group—beautifully preserved leaves spread out in the layers of the clay.

The series rests on the true London clay. Its maximum thickness is about 1200 feet

BA'GUL, or BHA'GUL, a small state in n.w. India, on the s. or left bank of the Sutlej. B. is one of the native states in feudal subordination to the Punjab government. Pop. estimated, '72, at 22,000. Its lat. is about 31° n., and long. 77° e. The surface is generally mountainous, presenting two summits, Bahadurgarh and Bara Devi, respectively 6233 and 7003 ft. above the sea. B. has a supposed gross revenue of £6000, pays 3600 rupees as tribute, and has 222 men under arms.

BAHA'MAS, or LUCAY'OS, a chain of islands stretching in a n.w. direction from the neighborhood of the n. coast of Hayti to that of the e. coast of Florida. From Florida they are separated by the channel through which flows the gulf stream (q.v.); and from Cuba, by the old Bahama channel. These are the principal passages between the open ocean and the gulf of Mexico. The chain extends in n. lat. from 20° 55′ to 27° 31′, and in w. long. from 72° 40′ to 79° 5′, having an entire length from n.w. to s.e. of about 550 m.; and it rests mainly on two shoals—the Great Bank to the s., and the Little Bank to the n. There are upwards of 3000 islands and rocks, but only about 30 of any size. The chief members of the group, if reckoned from the n.w., are these: Great Bahama; Abaco; Eleuthera; New Providence; Andros; Guanahani or Cat island, or San Salvador; Watling's island; Exuma; Long island; Crooked islands; Maricuana; Inagua; Little Inagua; Caicos; Turk's island.

The area is 3021 sq.m.; and in 1871 the pop. was 39,162. The pop. of Turk's island, officially separate from the B., is 4723. The revenue of the B. in 1874 was £36,573; the expenditure, £36,627. The value of the total imports in 1873 was £226,306; of the exports, £156,613. The islands generally are of reef-like shape, long, narrow, and low. With very little appearance of soil, they derive considerable fertility from the tendency of the porous rock to retain moisture. Besides excellent pasturage, they yield guinea-corn, maize, cotton, pine-apples, lemons, oranges, pimento, and a species of cinnamon. In the larger islands, too, there is excellent timber. Cotton cultivation received a great impulse during the American civil war. During the summer, the temperature ranges from 73° to 93° F.; but in the winter the climate is so delightfully temperate as to be generally prescribed in the United States for pulmonary complaints. The annual fall of rain is from 43 to 45 in., being heaviest in Oct., Nov., and Dec., but pretty equally distributed over the other months. On Oct. 1, 1866, a furious and most destructive cyclone visited the Bahamas.

The B. were Columbus's earliest discovery. But the precise spot of his first landing has not been ascertained. Guanahani or Cat island has generally been believed to be the San Salvador of Columbus; but recent investigations appear to have transferred the honor to Watling's island, situated a little further to the east. The B. having been depopulated, but not again colonized, by the Spaniards, were occupied by the English in 1629—to whom, after various vicissitudes of fortune in the wars with Spain and France, they were ultimately secured by the treaty of 1783. Nassau, in New Providence, is the seat of government, and has recently been greatly improved both as town and port. During the American civil war, Nassau became the station for vessels about to run the blockade of the southern ports, and thence derived unexampled prosperity; and so far as agriculture is concerned, the impulse then received has been maintained by the Bahamas.

BAHAR' (also spelt *Behar* and *Bihar*), one of the old Mohammedan provinces of India, occupying part of the valley of the Ganges, and named after its chief town, a city which in 1872 had a pop. of 44,295. B. is now one of the provinces of lower Bengal, and is divided into the two commissionerships of Patna and Bhagulpore, which are again subdivided into 12 administrative districts. The area of the province is 42,417 sq.m., and the pop. (1872) 19,736,101, giving an average of 553 persons to the sq. mile. The name B. was also given to one of the administrative districts, now officially called Gayah. Roads and bridges can neither be well made nor thoroughly repaired, where, during nearly half the year, the surface of the country is inundated, and torn by innumerable torrents. In the dry season, the beds of the rivers present only detached pools. Among the minerals, the most important are coal and mica. The latter, nearly as pellucid as glass, is sometimes found in blocks, yielding plates of 36 in. by 18. Potatoes, cabbages, cauliflower, lettuces, turnips, etc., have been introduced from Europe, and succeed well. Of indigenous productions, the most considerable are rice, pulse, sugar, cotton, indigo, and tobacco. The district is largely engaged in the manufacturing of muslins, silks, carpets, blankets, tents, tapes, threads, ropes, paper, glass, cutlery, jewelry, leather, ink, soap, and pottery. Ardent spirits, too, are extensively distilled from the flowers of the *bassia latifolia* (q.v.). Before the days even of Moslem domination B. appears to have been the center of a Hindu empire, which native accounts describe as of matchless splendor, and of fabulous duration.

BAHAR', or BEHAR, a t. of Bengal, 34 m. s.e. by s. from Patna, the chief t. of a British district of the same name (see BAHAR). According to the census returns of 1871, it contains a pop. of 44,295. The original city is nearly deserted, and the present town consists of houses scattered about its remains, and interspersed with fields, gardens, and groves. There are some remains of fine mosques. The ruin of this town began with its sack by the Mahrattas about 1742, and was completed by famine some years after.—The present district of Bahar is but a small portion of the great province which was called by that name in the empire of Delhi.

BAHI'A, capital of the Brazilian province of the same name. It is otherwise called San Salvador—the more usual term being taken from *Bahia de Todos-os-Santos*, or *bay of All Saints*, on which it is situated, in lat. 13° 1′ s., and long. 38° 32′ w. B. contained, in 1874, 152,000 inhabitants, pretty equally divided between whites, blacks, and mulattoes. B. has an exchange, arsenal, and imperial dockyard, besides many ecclesiastical

and public institutions; and is the point of departure for a railway line. It is connected by submarine telegraph with Pernambuco, Para, and Rio. The value of imports of foreign goods into B. in 1874, was £1,455,985; and the value of exports in the same year, £1,384,349. The chief exports of B. are sugar, cotton, coffee, tobacco, rice, rum, dye-stuffs, fancy woods, cocoa-nuts, horns, hides, diamonds, and bullion; and it imports manufactured goods, provisions, flour, salt, iron, glass, and wines. B. is the oldest city in Brazil, having been founded by the first captain-general of the country, and was long the capital of the colony. As a port, B. is unrivaled.

BAHI'A, a province of Brazil, about the middle of the coast, taking its name from its chief city. It extends in s. lat. from 10° to 16°, and in w. long. from 37° to 44°. Pop. in 1873 was 1,450,000. The wealth of B., consisting in valuable timber, in rich mines of gold, silver, copper, lead, iron, in deposits of potash, alum, etc., is in great measure lost for want of good roads. The interior contains lofty sierras; but the maritime districts are fertile, being well watered by the Itapicuru, Contas, and other rivers. Besides the streams that flow through B., the San Francisco, a vastly larger river, forms about half of the inland boundary, dividing this province from that of Pernambuco.

BAHI'A HON'DA, a harbor on the n. coast of Cuba, 60 m. w.s.w. of Havana, protected by a fort, and formerly much resorted to by privateers and slavers.

BAHNA'SA, or BEHNE'SEH, a t. of central Egypt, on the Bahr Yousef (Joseph's canal). It is noteworthy as the site of the ancient *Oxyrynchus,* celebrated for its numerous monasteries, the ruins of which are still to be seen.

BAHR, an Arabic word signifying a large body of water, is applied both to lakes and rivers.—BAHR-EL-ABIAD (the White river), and BAHR-EL-AZRAK (the Blue river), are the chief branches of the Nile (q.v.).—BAHR-ASSAL is lake Assal (q.v.).—BAHR-BELA-MA (the Sea without Water), a long, deep valley in the desert w. from Cairo. It is completely barren, but has the appearance of having been once a watercourse.

BÄHR, JOH. CHRISTIAN FELIX, an eminent German philologer and critic, was b. 1798, at Darmstadt. He was educated at the Heidelberg gymnasium and university, where he gained the favor and friendship of Creuzer, whose symbolic system of interpretation in mythological matters he himself pursued at a later period. He was elected a professor in 1826. Previous to this, he had occupied himself chiefly with the elucidation and criticism of Plutarch, the result of which was an annotated edition of *Alcibiades* (Heid. 1822), and of *Philopoemen, Flaminius, Pyrrhus* (Leip. 1826). At the same time, he collected and published the fragments of Ctesias. But a greater interest was excited by his *History of Roman Literature* (1828), which is noted for its clearness and comprehensiveness. Three supplements to this work also appeared: *The Christian Poets and Historians of Rome* (1836), *The Christian-Roman Theology* (1837), and the *History of Roman Literature in the Carlovingian Period* (1840). One of his most important works is his version of Herodotus 1832–35. In 1835, he published his *De Universitate Constantinopoli Quinto Sæculo Conditâ.* He likewise contributed numerous articles to Jahn's *Jahrbücher für Philologie,* and other works. He d. 27th Nov., 1872.

BAHRDT, KARL FRIEDRICH, a German theologian of the extreme skeptical school, was born, 1741, at Bischofswerda, in Saxony, and studied at Leipsic, where he soon displayed extraordinary talents, and some restlessness of disposition. His early theological writings betrayed the skeptical tendencies which were afterwards more fully developed. On account of his immoral conduct, however, he was, in 1768, compelled to leave Leipsic, where he had been a popular preacher. In Erfurt, his next residence, he was appointed professor of philosophy and Hebrew antiquities, and wrote *Letters on a Systematic Theology,* and *Aspirations of a Mute Patriot,* two works whose heterodoxy involved him in controversies, and made his position untenable. In 1771, he went to Giessen, where he delivered theological lectures, and preached with approbation. His translation of the New Testament was regarded as so dangerous, that the author was deprived of the privilege of teaching. His creed, in fact, was simple deism, and one of the chief points in his theology was his rejection of miracles. Even the immortality of the soul was not positively maintained in his works. Ultimately, after attempting to establish various institutions, he was reduced to the position of a tavern-keeper; and as he still persevered in his attacks on orthodoxy, he was imprisoned for one year at Magdeburg, where he wrote an autobiography. Among his other works are *The Religious Edict* (a satire on the Prussian religious edict of 1788), and *The German Union.* He died at Halle, April 23, 1792.

BAHRDT, KARL FRIEDRICH, D.D., 1741–92; a German professor of theology, whose attacks upon orthodoxy and the clergy resulted in a year's imprisonment at Magdeburg. He contested the authority of miracles, and was in every way a severe critic of Scripture. His conduct was notoriously irregular; at one time he lectured on moral philosophy in the forenoon, and in the afternoon officiated as landlord of a public house.

BAHREIN' ISLANDS, or AVÂL ISLANDS, a group of islands lying in the Persian gulf. The most important of these is Bahrein, or Avâl, about 27 m. long, and 10 broad. It is hilly in the center, but the soil generally is fertile, and produces dates, figs, and other eastern fruit, besides wheat and barley. Bahrein is badly cultivated.

Spring-water is plentiful in the interior, but on the coast it can only be procured from the bottom of the sea, where it springs up quite fresh, and is brought up by divers in skins. Manama, the capital, in lat. 26° 12′ n., and long. 50° 39′ e., has a good harbor on the n., but a safer though smaller one on the south. The B. I. are chiefly remarkable for their pearl fisheries, which were known in ancient times, and which employ, during the season, from 2000 to 3000 boats, each manned with from 8 to 20 men. The annual value of the pearls is estimated at from £200,000 to £300,000. Tortoise-shell, shark-fins, and dates are also articles of export. The islands, which have been subject to a good many political changes, are now inhabited by Arabs. Pop. 68,000.

BAI'Æ, a small t. of antiquity, on the coast of Campania, 10 m. w. of Naples, where the present castle of Baja stands. When the Roman empire was in its greatest splendor, the beauty of its situation, the fineness of the surrounding scenery, and the excellence of its mineral springs, made B. such a favorite resort of the Roman nobles, that for want of space for their baths, and villas they encroached on the sea. Julius Cæsar, Piso, Pompey, Marius, Julia Mammæa, and others, had country-houses at Baiæ. Horace preferred B. to all other places in the world. Seneca warned every one who desired to maintain dominion over his passions, to avoid this watering-place. Cicero thought it necessary to excuse himself for undertaking the defense of Marcus Cœlius, a man who had often visited B., for B. was considered by the stricter moralists of those times as the abode of voluptuousness and luxury, and a den of vice. The ruins, still standing on the desolate coast, or rising from the sea, are now the only evidence of the former magnificence of B., whose population, dwelling in mean hovels, only amounts to 800. The ruins of three supposed temples—one of Venus, one of Mercury, and one of Diana Lucifera—as well as the remains of a few *thermæ*, or warm baths, still attract the attention of archæologists. The harbor, one of the largest belonging to the Romans, is now much destroyed. The surrounding country is covered with the ruins of Roman villas, sepulchral monuments, and other buildings.

BAI'KAL (in Turkish, Bei-kul, i.e., Rich Lake) is, after the Caspian sea and the sea of Aral, the largest lake of Asia. It is a fresh-water lake, and is situated in the s. of Siberia, in the gov. of Irkutsk, near the great military road between Moscow, Kiachta, and the mines of Nertschinsk. Lat. 51° 20′ to 55° 30′ n., long. 103° to 110° e. It somewhat resembles a sickle in shape, and varies considerably in breadth. Between the mouths of the Selenga and the Buguldeicha, it is only 19 m. across. Its length is 370 m., and its breadth 20 to 70 m.; height above the sea, 1363 ft.; depth in center very great. The Baikal mountains, a spur of the Altaï, inclose the lake, which is fed by numerous streams, the chief of which are the Selenga and Bargusin. Its outlet is by the lower Angara, a chief tributary of the Yenisei; but the river is inconsiderable in size compared to those which flow into the lake. It has several islands, the largest of which, Olkon, has a length of 30 miles. B., which forms an important link in the chain of communication between Russia and China, has two commercial ports, and of recent years, steamboats have given a considerable impetus to its trade. Its sturgeon and seal fisheries are valuable, and large quantities of a fish resembling a herring are also caught in it. A peculiar fish, called the golomynka (*callionymus baicalensis*), which is almost one mass of fat, yielding beautiful train-oil, was at one time caught in immense numbers, but it is now much scarcer. The surface of the lake is frozen from Nov. to April, but the traffic is carried on over the ice. Besides the Russians settled on the banks of the Selenga and Angara, the shores of lake B. are also inhabited by tribes of the Burates and Tunguses.

BAIKIE, WILLIAM BALFOUR, 1824–63; a native of the Orkney islands. He joined the British navy, in which his father was a captain, and was made surgeon and naturalist to the Niger expedition in 1854. The senior officer died before reaching Africa, and B. took command. He explored the Niger for 250 m. in a small steamer, making a voyage of 118 days. In 1857, he was in a second expedition, the vessel of which was wrecked, and all except himself returned to England. He remained and settled for a time, with none but native assistants, at the confluence of the Benue and the Quorra. He formed a sort of commonwealth, in which he was not only a ruler, but teacher, priest, and physician. Within five years he opened the Niger to navigation, made roads, and established a market for the native trade. He studied and made vocabularies of nearly 50 native dialects, and translated into Housa portions of the Bible and prayer book. Only once during his residence was he compelled to use armed force against the surrounding tribes.

BAIL is a technical term in the practice of the law both in England and Scotland, with this difference, that, in England, it is used both in civil and criminal procedure, whereas in Scotland it is applied exclusively to the latter. By B. is understood the security given by sufficient sureties for the appearance in court on a day, and at a place certain, of a person arrested or imprisoned, and who, in consequence of such security or B., is in the meantime set at liberty. Such security, however, involves the assumption of the custody of the arrested or imprisoned party by his B., the meaning of the rule being that the party arrested or imprisoned is delivered into the hands of those who bind themselves for his forthcoming, in order that he may be protected from prison until he has to make his personal appearance; and in this sense, it differed from the old term, *mainprize*, now obsolete, and which signified a mere security without any other or corresponding guarantee, as in the case of bail. A technical and necessary distinction

is taken in law-books between what is called *common B.*, or *B. to render to prison*, and *special B.*, or *B. to the action;* but for general information, the following statement of the law may suffice.

In civil process, the sureties give their bail-bond to the sheriff himself for the appearance of the defendant, according to the exigency of the case, and for nothing else. It does not appear that any particular or limited number of sureties is to be taken; but it would seem that the sheriff may insist on more than two, provided they have only sufficient property within the county to answer the penalty; but if more than two be tendered, it is not necessary that each should be worth the full amount. On the other hand, the bail-bond will be good though there be only one surety; but in accepting such security it would seem that the sheriff does so at his own risk. If there is reasonable ground for believing the sureties to be sufficient, the sheriff has no discretion, but is bound to accept the B.; and if he refuses to do so, he is liable to an action.

The necessity of B., however, may be avoided by the defendant availing himself of the provisions of statutes which are re-enactments of older laws, by which it is enacted that the arrested or imprisoned party may obtain his immediate discharge by depositing with the sheriff the sum demanded by the plaintiff, together with £10 towards the cost, the same to remain in court to abide the event of the suit. The enactment, however, contains a proviso that it shall be lawful for a defendant who has made such deposit in payment, at any time in the progress of the cause, before issue joined, or final or interlocutory judgment, to receive out of court the sum so deposited and paid, upon putting in and perfecting special B., and paying such costs as the court shall direct; and, by another enactment of the same statute, provision is made for the case where a defendant who has put in B., afterwards elects to deposit the plaintiff's demand, and to pay the costs to abide the event of the action.

As to those who may or may not be B., it would appear, from the nature of the security undertaken, that persons privileged from arrest cannot be B., because the engagement on the part of the B. being, in default of the principal party, to pay the debt or damages and costs, the plaintiff is entitled to require the security of persons who are amenable to the ordinary process of the courts. Therefore, peers, members of parliament, ambassadors, and other privileged persons, cannot become B.; nor, generally, can attorneys or those employed in executing the process. But persons who are not in such a position, but who are either housekeepers or freeholders, may be taken as B. The possession of *leasehold* property is not enough, unless the party is also a housekeeper; but the real owner of a *freehold* estate, however small it may be, situated within the jurisdiction of the court, and provided he can otherwise make up the amount required, is qualified, though he be only a lodger, or merely an occupant by sufferance in the house of another. Again, to constitute a "housekeeper," within the meaning of the rule, the house must be within the jurisdiction of the court, and such a party must be the *bonâ-fide* tenant of the house in his own right, enjoying its benefits and bearing its burdens. A person, therefore, in lodgings in England, but with a house in Scotland, is not admissible as B.; and such B. must strictly in this sense be a *housekeeper*. B. has ceased to be usual since imprisonment for debt was abolished.

Besides these arrangements of the common law with regard to B., we may mention two other forms of it—namely, B. *in error*, and B. *in attachment*. The former is regulated by the common law procedure act (1852), 15 and 16 Vict., c. 76, by section 151 of which it is provided that proceedings in error shall not stay or delay execution on a judgment, unless the person alleging or pleading such error shall be bound, along with two sufficient sureties, in double the sum recovered by the judgment, in order to prosecute the proceedings in error with effect, and make payment of the costs, in the event of the judgment being affirmed, or the proceedings in error being discontinued. B. in attachment, again, signifies the sureties required for a party arrested upon a writ of attachment, and brought up before a judge in order to obtain his discharge from custody, the sureties undertaking that he shall appear and answer such interrogatories as may be required of him. This, however, only applies to attachment in the case of *contempt* of court; for it would appear that an attachment for the non-payment of money, or the non-performance of an award, is not bailable. In the court of chancery, also, there are rules for accepting B.; as, for instance, for a defendant against whom attachment has issued for his contempt in not making appearance to the plaintiff's suit; but an attachment for non-performance of a decree in chancery is not a bailable process.

In criminal procedure, the subject of B. is at present regulated by the 11 and 12 Vict. c. 42, which provides that if the justice or justices, before whom a prisoner is brought, shall be of opinion that the evidence against the prisoner be sufficient, or even if it raise a strong or probable presumption of his guilt, they shall either commit him to prison, or admit him to B.—that is, allow him to be discharged on entering into a recognizance—with some sufficient surety or sureties—to appear and surrender himself to custody, to take his trial on such indictment as may be found against him, in respect of the charge in question, at the next assizes or sessions of the peace. The crime of treason, however, is not a bailable offense, except by order of a secretary of state, or by the court of queen's bench, or by a judge thereof in vacation. But justices are bound to admit to B. in all cases of misdemeanor, excepting in the case of a misdemeanor in receiving property stolen or obtained by false pretenses, etc., or the case of any misdemeanor for the

prosecution of which the costs may be allowed out of the county rate, as to all which misdemeanors, as well as in all felonies—treason excepted—justices and magistrates have a discretionary power either to admit to B. or to commit to prison. The court of queen's bench exercises a paramount jurisdiction, and can bail in all cases whatsoever; but it is not usual for that court or for justices or magistrates to admit to B. in any case of felony, except under circumstances of a special and favorable kind.

In Scotland, the term B., as we have mentioned, is only used in the proceedings in the criminal courts; and there the general distinction is taken between offenses that are capital and not capital, the former not being bailable except by order of the high court of justiciary, who exercise a power in this respect analogous to the jurisdiction of the court of queen's bench; offenses that are not capital being bailable by magistrates, sheriffs, or other competent judges. In the *civil* process of the Scotch courts, the term corresponding to B. is CAUTION (q.v.).

BAIL (*ante*) in the United States is substantially the same as in England. One who becomes surety for another is his B. "B. above" are sureties who agree either to satisfy the plaintiff as to his claims and costs, or in case of judgment against a defendant, to deliver him up. "B. below" are sureties for the defendant's appearance, or that he will give bail. "Civil B." is taken in civil actions; "common B." amounts to entering an appearance when fictitious sureties are named; "special B." applies to cases in which there are responsible sureties. B. may be given in all cases of arrest in civil action. It is a general rule that a person held to B. in a civil case cannot be held a second time for the same cause of action, unless in another state. In criminal cases, except capital crimes, the defendant may generally be admitted to B., and even in the higher crimes B. may be accepted in the discretion of the court, or in the absence of legal provision to the contrary. In any case of offense against the nation, not punishable with death, any United States judge or state judicial officer may take B.; but if the punishment be death, only a United States judge can decide upon B. The form of entering B. is the same in the several states as in England. Mitigation of excessive B. is usually obtained by application to the court; and the exaction of such B. is forbidden by the federal constitution. The power of sureties over the person bailed is wide. They are technically his jailers, and may arrest him anywhere, or at any time, even on Sunday, or in the attendance at court; they may command assistance, and may depute their power to another. Refusing or delaying B. is an offense against personal liberty, but is not actionable unless malice can be shown. Sureties must in most cases be citizens and freeholders, or possessed of means that will satisfy the court.

BAIL COURT is the name given to a new and supplementary tribunal at Westminster, called into existence by the 11 Geo. IV. and 1 Will. IV. c. 70, by which, after providing for the appointment of an additional puisne judge in each of the three courts of common law, it is made lawful for any one of the judges of either of these courts, when occasion shall so require, where the other judges of the same court are sitting in banc (see BANC), to sit apart from them for the business of adding and justifying special bail, discharging insolvent debtors, administering oaths, receiving declarations required by statute, hearing and deciding upon matters in motion, and making rules and orders in causes and business depending in the court to which such judge shall belong, in the same manner and with the same force and validity as may be done by the court sitting in banc.

This statute has been hitherto acted on only by the court of queen's bench, wherein one of the judges sits from time to time in the B. C. for the purposes above specified. It may be remarked that a rule of the B. C. cannot be re-opened in the full court after the term in which it is made, even though the judge who pronounced it sanctions the application; and a judge sitting apart, under the authority of the statute, has equal authority with the full court to reverse the decision of a judge sitting at chambers. See Lush's *Practice* by Stephen.

BAILEE'. See BAILMENT.

BAILEN, a t. in Spain, 24 m. n.n.w. of Jaen; pop. 7831; probably in or near the site of ancient Bæcula, where Scipio defeated Hasdrubal in 269, and Masinissa in 206 B.C. Near B. was fought the great battle of Navas de Toloso, in 1212, when the Spaniards broke the power of the Moors, who are said to have left the incredible number of 200,000 of their dead on the field, with a loss of only 95 Christians. Here, July 23, 1808, the French gen. Dupont capitulated, surrendering 17,000 men to the Spaniards —the first great disaster to the French arms in the peninsular war. There is a ruined castle here, formerly belonging to the counts of Benavente, but now to the Osuna family.

BAILEY, derived through the French *baille*, from the middle-age Latin BALLIUM, which is a corruption of the Lat. *vallum*, a rampart. The B. was the whole space inclosed within the external walls of a castle, with the exception of that covered by the keep. This space was variously disposed of, and, of course, differed greatly in extent. Sometimes it consisted of several courts, which were divided from each other by embattled walls, so as to form a series of fortifications. When these courts were two in number, they were known as the outer and inner bailey. The entrance to the B. was

generally by a draw-bridge over the ditch, and through a strong machicolated and embattled gate. The B. was often of great extent, containing the barracks for the soldiers, lodgings for workmen and artificers, magazines, wells, chapels, and sometimes even a monastery. In towns, the B. had even a wider signification, and was often retained after the castle or keep had long disappeared, as in the case of the Old B. in London, and the B. in Oxford.

BAILEY, GAMALIEL, 1807–59; b. N. J.; studied medicine in Philadelphia, and graduated in 1828; visited China as ship's physician; was editor of the *Methodist Protestant* in Baltimore; with James G. Birney started, in 1836, the *Cincinnati Philanthropist*, an abolition journal. His press was destroyed by a mob, but he continued the paper until 1844. In 1847, he began in Washington the *National Era*, which was mobbed in the next year, but not suppressed. Wanting a story for his paper, Dr. B. inclosed 100 dollars to Harriet Beecher Stowe, asking her to send him something. She sent one of the chapters of *Uncle Tom's Cabin*, without the remotest idea of the stupendous fame it was to achieve. Dr. B. died at sea while on the way to Europe for the benefit of his health.

BAILEY, JACOB WHITMAN, 1811–57; a naturalist, graduate of West Point military academy, and lieut. of artillery; professor of botany, mineralogy, and chemistry in the academy in 1839, winning much distinction for microscopical researches, and publishing a volume of illustrations. He made a collection of 3000 objects, marked and catalogued; and of algæ he gathered 4500 specimens. These, with his books, went to the Boston society of natural history. He was president of the American association for the advancement of science in 1857, in which year he died. His health, never very strong, was broken by exposure while rescuing his wife and daughter from the steamboat *Henry Clay*, burned on the Hudson river five years before.

BAILEY, PHILIP JAMES, a distinguished living poet, was b. at Basford, in the co. of Nottingham, in the year 1816. His early education was conducted in his native town, and afterwards he became a student at the university of Glasgow. He was called to the English bar in 1840, but never practiced. The first edition of *Festus*, the poem by which he is best known, was published in 1839, and has in subsequent editions received a large amount of new matter. It attracted considerable notice in England, and was in America assailed by a perfect tornado of applause. While the enthusiasm lasted, Mr. B. was in certain quarters mentioned in the same breath with Shakespeare, Milton, and Goethe. This injudicious admiration was, however, certain to cool down, and to prove more prejudicial to the real interests of the author than unmerited censure itself; consequently, in literary journals, *Festus* is frequently mentioned with a contempt which it is far from deserving. It is a wonderful work, when the age of the author at the period of its production is taken into account. It was commenced before the author had reached his 20th year, and completed in three years. *Festus* errs from excess of boldness. Mr. B. speaks of universes as other poets speak of buttercups. He has the *entrée* to the highest heaven and to the regions of penal fire. He is on terms of perfect familiarity with eternity. He lays his scenes in the "center," "elsewhere," "everywhere," "nowhere." Despite its extravagance, *Festus* is full of poetical thought and felicitous expression, and has occasional dashes of grim humor in it, not unworthy of Goethe's mocking fiend himself. The faults of the poem are as great as the beauties; there is no congruity or proportion in it, and you lay it down with a sense of admiration qualified with disgust. In 1850, Mr. B. published the *Angel World*, which possesses all the faults and all the beauties of the former work on a reduced scale. If the reader's admiration is less, his disgust is less. The *Angel World* is now incorporated with the larger work. Mr. B.'s subsequent writings have been the *Mystic*, the *Age*, a colloquial satire, and the *Universal Hymn* (1867). The first production is in the writer's early style, with all the beauties deleted. But whatever measure of success may attend Mr. B. in "elsewhere," and "nowhere," complete failure awaits him when he deals with mankind and the ordinary affairs of earth.

BAILEY, SAMUEL, a writer on politics, political economy, mental philosophy, and other subjects, was b. in 1791 in Sheffield, where afterwards he became a banker. He d. Jan. 18, 1870, leaving £90,000 as a bequest to the town. His works are: *Essays on the Pursuit of Truth and on the Progress of Knowledge* (1821); *Questions for Discussion in Politics, Political Economy, and other Departments of Knowledge* (1823); *A Critical Dissertation on the Nature, Measures, and Causes of Value* (1825); *A Letter to a Political Economist, occasioned by an Article in the Westminster Review on the Subject of Value* (1826); *Essays on the Formation and Publication of Opinions* (1829)—a sequel to his work on the *Pursuit of Truth;* *A Discussion of Parliamentary Reform* (1831); *The Rationale of Political Representation* (1835); *The Right of Primogeniture Examined* (1837); *Money and its Vicissitudes in Value* (1837); *A Defense of Joint-stock Banks and Country Issues* (1840); *A Review of Berkeley's Theory of Vision* (1842); *A Letter to a Philosopher in Reply to some Recent Attempts to Vindicate Berkeley's Theory of Vision* (1843); *The Theory of Reasoning* (1851); *Discourses on Various Subjects, Literary and Philosophical* (1852); *Letters on the Philosophy of the Human Mind* (three series, 1855, 1858, 1863); *On the Received Text of Shakespeare's Dramatic Writings, and its Improvement* (2 vols., 1862, 1866).

Mr. B.'s works on the *Pursuit of Truth* and the *Publication of Opinions* gave a great impetus to liberal and advanced views. His writings generally are distinguished by independent thinking, logical precision, a careful English style, and warm aspirations for the improvement of mankind. His treatises on the mind, while abounding in original suggestions, expand and enforce the views of the school of Locke in metaphysics, and what is termed the doctrine of utility in morals.

BAILEY, THEODORUS, b. N. Y., 1805; a naval officer; midshipman in 1818; lieutenant in 1827; commander in 1849; captain in 1855; commodore in 1862; rear-admiral in 1866. He was in the service in the Pacific during the war with Mexico. In the civil war he was in command of the frigate *Colorado*, and led the right column of Farragut's fleet in the opening of the Mississippi and the capture of New Orleans. In 1867, he was placed on the retired list.

BAILEY, or BAILY, NATHANIEL, or NATHAN, d. 1742; an English lexicographer, whose dictionary, published about 1721, was far superior to any then extant, and which formed the basis of Johnson's great work. He was a school teacher at Stepney, and author of several educational works.

BAI'LIE, a Scotch term, with several legal applications. It chiefly, however, and popularly, signifies a superior officer or magistrate of a municipal corporation in Scotland, with judicial authority within the city or burgh. In royal burghs, the office is in some respects analogous to that of alderman in England. The chief magistrate of a Scotch corporation, called the *provost* (q.v.) and often one or more of the bailies, are, in virtue of their office, in the commission of the peace; and by the 6 Geo. IV., c. 22, bailies are exempted from serving on juries. There are also *bailies of regality* and *barony*, who are appointed by the *superior* or over-lord of the manor (q.v.), with limited powers fixed by the 20 Geo. II., c. 43. There is a B. for the sanctuary or abbey of Holyrood, appointed by the Duke of Hamilton as hereditary keeper, and having jurisdiction within the precincts. See ABBEY, SANCTUARY. The word B. was also formerly a term in the practice of Scotch conveyancing, and signified an officer who represented the seller, and who, as such, gave *seisin* or sasine (q.v.), or delivery of the lands sold to the buyer or his attorney; but by the changes and simplifications effected by recent legislation, the office of B. in this sense may be said to be virtually abolished; indeed, by the 21 and 22 Vict., c. 76, s. 1, called *The Titles to Land Act*, seisin itself, as a separate and independent documentary title, is declared to be unnecessary, and registration of the conveyance of the estate held to be sufficient.

BAI'LIFF in English, BAILIE in Scotch, BAILLI in French, and BALIO in Italian, are terms having a common origin—namely, the middle Latin *ballivus*, which is again connected with the older form, *bagalus*, or *bajulus*. Through all the changes of application they have undergone in the course of history, they have continued to agree in denoting an overseer of some kind—an officer exercising superintendence on behalf of some superior authority. At the Greek imperial court in Constantinople, the chief tutor of the imperial children was called bajulos. The same title seems also to have been given in Constantinople to the superintendent of the foreign merchants, who was appointed by the Venetians, and it may possibly be for this reason that the title balio came at length to be applied also to the Venetian ambassadors themselves. The title ballivus was introduced by the knights of St. John into the s. and w. of Europe, as the eight members of their chapter were called *ballivi conventuales*, whence also the name ballei, given to the circles into which the possessions of the order were divided. In France, the royal baillis were at one time commanders of the troops, administrators of the royal domains, and judges each in his district. In later times, the royal baillis were deprived of the two latter offices, and were consequently then called baillis d'epée only. Proprietors of estates, also, possessing supreme jurisdiction, appointed baillis to superintend these courts of justice. As very little knowledge was required for these situations, and as they might be purchased, they were held in little estimation; and in later times, the baillis became standing characters on the stage, held up to ridicule on account of their ignorance and their absurd pretensions, as well as for cheating and injustice. In England, the name B. was introduced in the reign of William I., to designate the superintendents of counties, which were called ballivæ.

BAILIFF, in English law, is a legal officer, and may be described as the keeper, protector, or superintendent of some duty or charge legally imposed on him. As officers of the law, bailiffs put in force arresting process, and they perform other duties within the co. or bailiwick required of them by the sheriff, who is their immediate official superior. In this sense bailiffs are either *bailiffs of hundreds*, or *bound bailiffs*. The duty of the former is to collect fines, summon juries, attend the judges and justices at the assizes and quarter sessions, and execute writs and process s in the several hundreds. *Bound* bailiffs, again, are officers usually joined by the sheriffs with the bailiffs of hundreds, and employed on account of their adroitness and dexterity. They are called bound bailiffs, because the sheriff, being civilly responsible for their official misdemeanors, they are annually bound in an obligation, with sureties, for the due execution of their office. There are also *special bailiffs*, who are officers appointed by the sheriff on the application of the party suing out the process to be executed; and whenever a party thus chooses

his own officers, he is considered to discharge the sheriff from all responsibility for what is done by him. There is, besides, another exceptional class of bailiffs, called bailiffs of *liberties*, honors, manors, and other lordships and franchises, whose appointments, duties, and responsibilities are regulated by the 7 Vict. c. 19. The co. courts likewise have bailiffs for the execution of their process, as to whom see 9 and 10 Vict. c. 95, 12 and 13 Vict. c. 101, 13 and 14 Vict. c. 61, and 19 and 20 Vict. c. 108.

The sheriff himself is the *Queen's B.*, and, as such, it is his business to preserve the rights of the crown within his bailiwick. He must seize to the sovereign's use all lands devolved to the crown by attainder or escheat; must levy all fines and forfeitures; and must seize and keep all waifs (q.v.), wrecks, estrays, and the like, unless they be granted to some subject.

BAILIFF, HIGH. See HIGH BAILIFF.

BAILIWICK legally means the co. or district within which the sheriff's bailiffs may execute their office. Blackstone says that this word was introduced by the princes of the Norman line in imitation of the French, whose territory was divided into bailiwicks, as that of England into counties.

BAILLET, ADRIEN, 1649–1706; a French writer and critic. His parents were poor, but he found a friend in the bishop of Beauvais, who educated and advanced him to the priesthood. In 1680, he was librarian to the advocate general of the parliament of Paris, of whose library he made a remarkable catalogue in 35 folio volumes, all written with his own hand. He was an incessant worker, scarcely sparing time for needful rest. He wrote a *History of Holland from* 1609 *to* 1690 (a continuation of Grotius), in 4 vols.; *Lives of the Saints, Life of Descartes*, etc.; but his most valuable production is *The Judgment of the Learned on the Principal Works of Authors*, in 9 vols.

BAILLEUL, a t. of France, department of the Nord, with manufactures of woolens, cottons, lace, hats, beet-root sugar, etc.—the cheese of its neighborhood being also celebrated. Pop. in 1876, 8180.

BAILLIE, JOANNA, a modern poetess of distinguished merit, was b. in 1762 at Bothwell, in Lanarkshire, Scotland. Her father was a Presbyterian clergyman. She received a superior education, and soon began to manifest those talents which subsequently excited the admiration of the public. Her career was a singularly happy one, but devoid of all striking incident. At an early period, she went to reside in London, where her brother, Matthew Baillie, had established himself as a physician. Here she remained till her death, which occurred on the 23d of Feb., 1851, when she had attained the venerable age of 89. No authoress ever enjoyed a larger share of the esteem and affection of her literary contemporaries. All vied in showing her a courteous respect, and even America sent its votaries to her little shrine at Hampstead. Her greatest achievement is undoubtedly the *Plays on the Passions*, which, though erroneous in conception, are full of noble and impressive poetry, and often characterized by intense dramatic power. The principle upon which Miss B. proceeded in the construction of these works, was to take a single passion as the subject of a play, and to exhibit its influence on an individual supposed to be actuated by nothing else. In point of fact, such persons do not exist in society; men are swayed by a variety of conflicting emotions; and even when any one of these becomes dominant, it does not wholly destroy the rest, otherwise the victim of a ruling passion would lapse into a monomaniac. The leading personages of Miss B.'s plays are, therefore, rather impersonations of certain elements of human nature, than genuine human beings. They are vivid poetical studies in psychology; not mirrors held up to nature, like the brilliant and variegated creations of Shakspeare. Still, there are scenes, in her tragedies especially, where the interest of the reader is intensely excited by the great art shown in the minute delineation of a particular passion, and where he is forced to forget the artificial theory of the authoress. The first volume of the *Plays of the Passions* appeared in 1798, and met with remarkable success. Four years afterwards, she published a second volume; in 1804, *Miscellaneous Plays;* in 1812, the third volume of her *Plays of the Passions;* and in 1836, three volumes of dramatic poetry. The most popular as well as the most powerful of her works is the tragedy of *De Montfort*. It was brought upon the stage in London, Kemble acting for eleven nights the character of the hero. Many of Miss B.'s minor pieces are very sweet, simple, and beautiful; and are marked by a sprightly grace of versification, and a playful serenity of spirit, which pleasantly remind one of the personal character of the authoress herself.

BAILLIE, MATTHEW, M.D., a distinguished physician and anatomist, was b. on the 27th Oct., 1761, in the Manse of Shotts, Lanarkshire, Scotland. His father was descended from the family of B. of Jerviswood, so noted in the history of Scotland during the reign of Charles II.; his mother was a sister of the two celebrated anatomists, William and John Hunter; and one of his sisters was Joanna B., the poetess. Talent seems to have been both hereditary and abundant in the family. On account of his abilities, his father was appointed professor of divinity in the university of Glasgow, where young B. went through the usual curriculum, and afterwards proceeded to Balliol college, Oxford, as an exhibitioner on the Snell foundation. In 1780 he commenced his anatomical studies in London under the care of his uncle, and was frequently employed as demonstrator to

the latter in his theater at Great Windmill street. His success in this capacity was so great, that on the death of Dr. Hunter, in 1783, he was found qualified to become his successor. In 1784, he began to lecture, and acquired a high reputation as a vigorous and lucid expositor of the science of anatomy. In 1795, he published a small work entitled *The Morbid Anatomy of Some of the Most Important Parts of the Human Body.* It made an era in medical science. In addition to the information formerly scattered through the writings of Bonnetus, Lieutaud, Montagni, and others, it contained a multitude of ingenious observations made by his uncle and himself, and greatly enhanced our knowledge of the changes produced on the human frame by disease. It had a remarkable influence on the study of medicine, and excited in a greater measure, perhaps than any other book, a spirit of careful induction among professional men. In 1799, Dr. B. relinquished his anatomical lectureship, and in 1800, his appointment as physician to St. George's hospital, which he had held for 13 years. He now devoted himself exclusively to his duties as a medical practitioner, and by his honorable assiduity succeeded in realizing a large fortune. In one of his busiest years, when he had scarcely time to take a single meal, his professional income is said to have reached £10,000. In 1810, he was appointed physician to the king, and offered a baronetcy, which, however, he declined. At last, worn out with incessant labor, he died on the 23d Sept. 1823.

BAILLIE, ROBERT, one of the most eminent, and perhaps the most moderate of all the Scotch Presbyterian clergy during the time of the civil war, was b. at Glasgow in 1599, and educated at the university of that city. In 1622, he received episcopal ordination—episcopacy being then nominally the established religion of the country—from archbishop Law, and was shortly after presented to the parish church of Kilwinning. At first a maintainer of the doctrine of passive obedience, he seems to have changed his opinions on this point some time during 1630–36. In 1638, he sat in that famous general assembly of the Kirk of Scotland which met in Glasgow to protest against episcopacy being thrust on an unwilling people, but conducted himself with greater prudence and temperance than was quite agreeable to his excited brethren. However, he soon threw himself eagerly into the national cause. In 1640, he was selected by the Scottish leaders, on account of his pamphlet against Laud's party, as a proper person to go to London, along with other commissioners, to prepare charges against archbishop Laud, whose rash and tyrannical measures were alleged to have been the origin of the recent hostilities against the sovereign. On his return to Scotland in 1642, he was appointed joint-professor of divinity at Glasgow, along with Mr. David Dickson, an equally distinguished, but less moderate divine. In 1643, he was again sent to London as a delegate to the Westminster assembly of divines, where he conducted himself in an unobtrusive manner, but cordially concurred in the doctrines which were drawn up. It is curious to notice, in connection with this incident of his career, that though Mr. B. had himself experienced the injustice of intolerance, like almost every other theologian of his age, he vehemently discarded the principle of toleration, and asserted the divine right of presbytery with as much emphasis as Laud did the divine right of episcopacy. After the execution of Charles I., in 1649, B. was chosen by the church to proceed to Holland, and to invite Charles II. to accept the covenant and crown of Scotland. Though it was not easy to deal with one of Charles' slippery character, B. is admitted to have borne himself in the matter with great prudence and dignity. After the restoration, he was made principal of Glasgow university. He died July, 1662. His *Letters* are a valuable contribution to our knowledge of the times.

BAILLIE, ROBERT, of Jerviswood, happily described as the Scottish Sydney, was a native of Lanarkshire and distinguished himself during the latter part of the reign of Charles II. by his bold opposition to the tyrannical misgovernment of the duke of Lauderdale. Having on a certain occasion (June, 1676) rescued a relative, the Rev. Mr. Kirkton, from the clutches of archbishop Sharpe's principal informer, a wretched profligate of the name of Carstairs, who pretended that he had a warrant for the apprehension of the clergyman, but refused to show it, B. was actually prosecuted for interfering to prevent the illegal capture of his friend. For this purpose an ante-dated warrant was furnished to Carstairs, signed by nine of the councilors. The marquis of Athole afterwards admitted to bishop Burnet that he was one of the nine who lent their names to this infamous document. The case was therefore made out to be a tumult against the government. B. was fined in 6000 merks (£318). He refused to pay, and was sent to prison; but so strong was the indignation of the Scottish gentry that he was released at the end of four months, in consideration of payment of one half of his fine to Carstairs. In 1683, B. took a prominent part in a scheme of emigration to South Carolina, as he saw no other refuge from the degrading tyranny of the government. About the same time, however, he entered into correspondence with the heads of the new puritan party in London, whose leaders were Russell, Sydney, and the duke of Monmouth, and subsequently repaired to that city to concert measures for a vigorous insurrection against the government, not, however, so far as he was concerned, with a view to revolution, but as the only means of securing adequate reforms. On the discovery of the Ryehouse plot, B. was arrested and sent down to Scotland. Accused of conspiring against the king's life, and of being hostile to monarchical government, B. was tried at Edinburgh, and condemned to death upon evidence at once insufficient and illegal. His bearing both on his trial and during

his imprisonment was such, that his cousin, bishop Burnet, declared "it looked like the reviving of the spirit of the noblest of the old Greeks or Romans, or rather of the primitive Christians and first martyrs;" and the celebrated Dr. Owen speaks of him as a "great spirit," "a person of the greatest abilities I almost ever met with." The sentence was carried into execution on the 24th Dec., 1684. It is to be regretted that so few opportunities were afforded B. of achieving anything really great, for he seems from all accounts to have possessed a remarkable strength of character and noble fearlessness of spirit.

BAILLY, JEAN SYLVAIN, a distinguished French savant, president of the national assembly of 1789, and mayor of Paris, was b. in that city Sept. 15, 1736. Originally intended by his father for an artist, he first turned aside into literature, until, becoming acquainted with Lacaille, he was fortunately induced to study astronomy, which proved to be the true sphere of his genius. In 1763, B. presented to the académie des sciences his *Lunar Observations;* in 1766 appeared his *Essay on the Satellites of Jupiter, with Tables of their Motions;* and in 1771, a treatise on the light of these satellites, remarkable for the profundity of its astronomical views, and which classed him at once among the greatest astronomers of his time. His historico-scientific works, especially his *History of Indian Astronomy*, are full of learning and ingenious disquisition, and written with great elegance. In 1777 he published his *Letters on the Origin of the Sciences;* and in 1799 his *Atlantis of Plato.* In 1784 he was elected a member of the académie française; and in the following year, of the académie des inscriptions. The *éloges* which he wrote about this period for the académie des sciences on Charles V., Molière, Corneile, Lacaille, Leibnitz, Cook, and Gresset, were very highly praised. Fontenelle was the only Frenchman before him who had enjoyed the honor of being a member of the three académies at once. The revolution interrupted his peaceful studies. During the earlier part of it he occupied a very prominent position. Elected president of the national assembly, June 17, 1789, and mayor of Paris on the 15th of July, he conducted himself in these capacities with great integrity and purity of purpose; but at last lost his popularity by allowing the national guard to fire on the masses who were assembled in the Champs de Mars, on the 17th of July, 1791, to demand the dethronement of the king. He now threw up his mayoralty, considering it impossible to satisfy either party, withdrew altogether from public affairs, and went to live first at Nantes, and afterwards with his friend Laplace at Melun. Here he was seized by the Jacobin soldiery and brought to Paris, where he was accused of being a royalist conspirator, condemned and executed with the usual Jacobin preliminary of savage insult, Nov. 11, 1793. Among his papers were found, and afterwards published, an *Essay on the Origin of Fables and Ancient Religions* (1799), and *Memoirs of the Revolution by an Eye-Witness* (1804). There cannot be two opinions regarding the merit of B.'s style, but his historico-astronomical speculations are now considered fantastic.

BAILMENT, an English law term, defined to be "a delivery of goods for a particular purpose, upon a contract, expressed or implied, that the purpose shall be carried into effect, and that, when that is done, the goods shall be restored by the bailee, or person to whom they are delivered, to the owner or bailor, or according to its directions."—*Tomlin's Dict*

BAILMENT (*ante*), the delivery of something of a personal nature by one party to another, to be held according to the purpose or object of the delivery, and to be returned, or delivered over, when that purpose is accomplished. B. may be divided into three kinds: 1. For the benefit of the bailor, or some person whom he represents. 2. For the benefit of the bailee, or some person represented by him. 3. For the benefit of both parties. In the first class, the bailee is required to exercise only slight care, and is responsible only for gross neglect. In the second he must exercise greater care, and is held for slight neglect. In the third he is to exercise ordinary care, and is responsible for a neglect not extraordinary. A person receiving the goods of another to keep without recompense, acting in good faith and keeping them as he would his own, is not answerable for their injury or loss; for, as he derives no benefit, he is responsible only for bad fault or gross neglect. This responsibility may be more or less by special acceptance, and a spontaneous offer on the part of the bailee may require him to be more careful. But the borrower who receives the entire benefit of the B. must use extraordinary diligence in the care of the property, and may be held for the slightest neglect. It must be used by him only for the purposes for which it was borrowed; he cannot keep it beyond the specified time, nor hold it as a pledge for demands otherwise made against the bailor. In the third class, the benefits are reciprocal, and advantage accrues to both parties; the parties stand upon equal footing, and neither can require more than ordinary care and prudence. In B. the depositary has the right of possession against any but the true owner. A borrower has no property in the thing borrowed, but may protect his possession by action against a wrong-doer. The hire of things for use transfers a special property in them for the use agreed upon; the price paid is the consideration for the use, and the hirer becomes for the time proprietor of the things bailed, having the right to keep them for the time agreed upon. In general, the hire of labor and services is the essence of every species of bailment in which compensation is to be given for care and attention bestowed upon the things bailed. The contracts of

warehousemen, carriers, forwarding and commission merchants, factors, and all who receive goods to deliver, carry, forward, sell, or keep, are of this nature, and involve the hiring of services. In a more limited sense, a B. for labor and services is a contract by which materials are delivered to a laborer or artisan to be wrought into some other form. The title remains with the party delivering the goods, and the workman acquires a lien upon them for his services. The owner may reclaim his property after the work is done, but the laborer can hold it until he is paid. Inn-keepers and common carriers are held responsible for goods intrusted to them except against inevitable accident, or against the public enemy. They are in effect insurers. The inn-keeper is responsible for the property of a guest, though it may be lost by theft. The common carrier is responsible in case of loss by fire, unless caused by lightning or tempest.

BAILY, EDWARD HODGES, R.A., an eminent sculptor, was b. at Bristol on the 10th Mar., 1788. In 1807 he went to London, saw Flaxman, and entered his studio. In 1809 he gained the silver medal at the society of arts and sciences, and the silver and gold medals at the royal academy. His works during this part of his career were chiefly, if not altogether, classical figures. They exhibit great care in execution, and are simple and pure in conception; but it was not till his twenty-sixth year that the full power and originality of his genius manifested itself in his celebrated "Eve at the Fountain," a figure of exquisite grace and loveliness. His next works were, "Hercules Casting Lycus into the Sea," "Apollo Discharging his Arrows," and "Maternal Love." George IV. also employed him, along with other artists, to execute the sculpture in front of Buckingham palace, the figures on the marble arch, and the "Triumph of Britannia," as also the *bassi-relievi* that surround the throne room. Besides these, B. executed a great number of busts and statues of distinguished contemporaries, such as Telford the engineer, earl Grey (14 ft. high), and Sir Astley Cooper. The statue of Nelson, in Trafalgar square, is likewise the work of his hands. His "Eve Listening to the Voice," the "Sleeping Nymph," "Girl Preparing for the Bath," and "The Graces Seated," are among the finest efforts of his genius. D. 22d May, 1867.

BAILY, FRANCIS, an eminent English astronomer, was b. at Newbury, Berks, in 1774, and d. in London, in 1844. In the midst of active business as a London stock-broker, he laid the foundation of his scientific fame, and during the years of life usually devoted to repose, underwent labors and rendered services to astronomy, which entitle him to be regarded as one of the most remarkable men of his time. Among the chief of these services were his share in the foundation of the astronomical society, and in the improvement of the *Nautical Almanac,* his laborious repetition of Cavendish's pendulum experiments, and the production of the astronomical society's star-catalogue. The latter, says his biographer, Sir J. Herschel, "put the astronomical world in possession of a power, which may be said, without exaggeration, to have changed the face of sidereal astronomy." In addition to several standard works on life-annuities, etc. (1808–13), and an immense mass of contributions to the *Memoirs of the Astronomical Society,* he wrote a valuable *Life of Flamsteed* (1835), which gave rise to much hot discussion on the subject of that eminent man's connection with Newton.

BAIN, ALEXANDER, writer on mental philosophy, was b. at Aberdeen in 1818. He entered Marischal college and university in 1836, and graduated in 1840. From 1841 to 1844, he assisted the professor of moral philosophy in Marischal college, and in 1844–45, taught the class of natural philosophy. In the winter of 1845–46, he lectured on natural philosophy in the Andersonian university, Glasgow. In 1847, he became assistant-secretary to the metropolitan sanitary committee, and was thence transferred to the same office in the general board of health, which office he resigned in 1850. From 1857 to 1862, and from 1864 to 1869, he was examiner in logic and moral philosophy in the university of London. For several years he acted as examiner in mental philosophy at the India civil service examinations. In 1860, he became professor of logic in the university of Aberdeen.

Mr. B. began as a writer in 1840, by contributing to the *Westminster Review.* He also contributed a considerable number of treatises to the publications of W. and R. Chambers, especially in the educational department; among them was an edition of the *Moral Philosophy of Paley, with Dissertations and Notes* (1852). In 1855, he brought out *The Senses and the Intellect,* and in 1859, *The Emotions and the Will,* completing a system of the human mind. In 1861, appeared *The Study of Character, including an Examination of Phrenology.* In 1863, he published an *English Grammar,* and in 1866, a *Manual of English Composition and Rhetoric.* In 1868 appeared his *Mental and Moral Science, a Compendium of Psychology and Ethics;* in 1870, *Logic, Deductive and Inductive;* in 1872, *A Higher English Grammar;* in 1874, *Companion to the Higher English Grammar.* In 1872, he acted with prof. Robertson in preparing for publication Mr. Grote's posthumous treatise on *Aristotle;* and, in 1873, edited, with a critical introduction, Grote's minor works. In 1873, he brought out a work on the *Relation of Mind and Body.*

As a thinker and writer, B. is remarkable for the subtlety and minuteness of his analysis, and the clearness of his exposition. He belongs decidedly to the empirical or experimental school of philosophy, in opposition to the *a priori,* or transcendental. His chief work, *The Senses and the Intellect,* together with *The Emotions and the Will,* is the most complete systematic exposition of the phenomena of the human mind in the

English or perhaps in any language. B.'s psychology is based on physiology, after the manner of Hartley's; but instead of considering the human organism as capable only of receiving impressions and of acting in response thereto, he finds in it a power of originating active impulses (see SPONTANEITY), and thus obviates many of the defects alleged by *a priori* philosophers to inhere in the system of sensationalism, as hitherto exhibited.

BAINBRIDGE, WILLIAM, 1774–1833; b. N. J.; a naval officer commissioned lieutenant in the reconstruction of the service in 1798. In that year his vessel was captured by the French, and he and his officers were kept prisoners for more than a year. In 1800, he transported a large sum of money to the dey of Algiers, who compelled him to convey an embassy to Constantinople. In the war against Tripoli he commanded the frigate *Philadelphia* and captured a frigate from the enemy; but his ship got aground, and he and over 300 men were kept prisoners until the close of the war. He was captain in 1806; and commodore in 1812, when he took command of the *Constitution* as his flag-ship, and went on a cruise with the *Essex* and *Hornet*. Off San Salvador, Dec. 26, he captured the British frigate *Java*. In 1815, he commanded a fleet of 20 ships intended to move against Algiers, but the impending war was avoided. During his career he was in command in the Mediterranean some half a dozen times, and settled several disputes with the Barbary rulers. For the capture of the *Java* congress gave him a gold medal, and distributed $50,000 to his men. In later life he was president of the board of naval commissioners.

BAINI, GIUSEPPE, one of the most distinguished scientific musicians of modern times, was b. in Rome on the 21st Oct., 1775. In 1795, when still only a pupil in the Seminario Romano, he was admitted among the singers in the Papal chapel, on account of his fine voice and his musical acquirements. Having been initiated by G. Zannaconi into the art of composition, he soon gained distinction by his compositions. The severe gravity and profound science of these contrasted strongly with the careless style and shallow dilettanteism of the modern Italian masters. B. has secured for himself a prominent place in musical literature, less, however, by his compositions than by his historical researches, which he found both encouragement and opportunity to make, when he was appointed director of the papal concerts in 1804, and general director of the choir in 1814. His principal work is his *Memorie Storico-critiche della Vita e delle Opere di Giov. Pierluigi da Palestrina*, etc. (2 vols. Rome, 1828). It is a valuable work, although disfigured by prejudices. The German edition of B.'s work, additions and explanations by Kandler, published by Kiesewetter (Leip. 1834), is especially deserving of notice, as very soon after its first publication it became a rare book on account of the small number originally published. Winterfeld published an edition with critical remarks (1832). B. died in 1844.

BAIRAKTAR', or, more correctly, Bairak-dar, signifying standard-bearer, is the title of the energetic grand vizier Mustapha. He was b. in 1755, and was the son of poor parents. He entered the military service at an early age, and soon distinguished himself by his valor. When he was pasha of Rustchuk in 1806, he fought not without success against the Russian army, which had advanced into Moldavia and Wallachia, and had taken Bucharest. After the revolt of the janizaries in 1807, by which Selim III. (q.v.) was deposed from the throne, in favor of Mustapha IV., B. at first concealed his attachment to the deposed monarch, and marched with his troops apparently against the revolted Servians; but as soon as he reached Adrianople, he compelled the grand vizier to return with him to Constantinople, in order to restore the throne to sultan Selim. On their return, they found this prince murdered, and his dead body lying in the first court of the seraglio. Filled with rage at this sight, B. caused all those to be executed who had had any share in the murder. He deposed Mustapha IV., and proclaimed the brother of this prince, Mahmoud II., sultan on the 28th July, 1808. B. was now appointed grand vizier. In the exercise of this office, he deposed the grand mufti, the leader of the janizaries, and all the ulemas who had taken any part in the last revolution; while at the same time he was careful to secure the tranquillity of the capital, and strengthened the regular army. His chief object was the annihilation of the janizaries; but, like the unfortunate Selim, he also fell a victim to these fierce bands of soldiery, who resisted everything like military discipline. Favored by the fanatical people, the janizaries rebelled, and, with the support of the fleet, attacked the seraglio on the 15th Nov., 1808, and demanded the restoration of Mustapha IV. B. defended himself bravely; but when he saw that the flames threatened to destroy the palace, and that he was in danger of falling alive into his enemies' hands, he strangled Mustapha, threw his head to the besiegers, and then blew himself up.

BAIRAM. See BEIRAM, *ante*.

BAIRD, ABSALOM, b. Penn., 1824; an officer in the union armies during the rebellion, a West Point graduate, captain in 1861, brig.gen. of volunteers in 1862. He was in constant service during the war, accompanied Sherman in the march through Georgia, and was at the surrender of Johnston's army at Durham station. He was brevetted maj.gen. of the regular army, and also of volunteers.

BAIRD, CHARLES WASHINGTON, D.D., b. N. J., 1828; son of Robert; graduated at the university of New York in 1848, and at Union theological seminary in 1851; Ameri-

can chaplain in Rome, 1851–53; pastor of a Reformed Dutch church in Brooklyn, 1859–61; since that time pastor of the Presbyterian church at Rye, N. Y. Dr. B. is the author of a work on Presbyterian liturgies, *A Book of Public Prayer*, a *History of Rye, N. Y.;* and has just completed an extensive and valuable history of the Huguenots, with especial reference to their migration to, and course in, the United States.

BAIRD, Sir DAVID, Bart., a general in the British army, was b. 6th Dec., 1757, at Newbyth, Scotland. He entered the service in 1772 as an ensign in the 2d foot, was promoted to a lieutenancy in 1778, and immediately after obtained a company in the 73d, a Highland regiment just raised by lord Macleod, with which he sailed to India. In the course of a few months, the young officer was plunged amid the perils of a sudden and sanguinary war. The English had excited the hostility of Hyder Ali by a gross breach of faith; and in the July of 1780, the latter burst into the Carnatic at the head of 100,000 men, disciplined and commanded by French officers. On the 10th of Sept., a portion of the English army fell into an ambuscade at Perambooum, and was cut to pieces. Among the few who remained alive to be taken prisoners was Baird, whose heroism had actually startled the French officers who were opposed to him. He was thrown into a dungeon at Seringapatam, where he endured a captivity of four years, that must have been peculiarly galling to a spirit so fierce, restless, and resolute as his. Released in July, 1784, he obtained the majority of the 71st in 1789, and in the Oct. of the same year visited England. In 1791, he returned, a lieutenant-colonel, and took part in several important sieges, attacks, and skirmishes; in 1795, he received a colonelcy; in 1798, he was raised to the rank of major-general; and in 1799 memorably signalized himself at the victorious assault of Seringapatam. He led the storming-party, having obtained that perilous honor at his own urgent request, col. Wellesley (afterwards duke of Wellington) commanding the reserve. In requital of his brilliant services, he was presented by the army, through the commander-in-chief, general Harris, with the state-sword of Tippoo Saib, and also with a dress-sword from the field-officers who served under him at the assault. His merit was likewise acknowledged by the home government. In the following year, he was appointed to the command of an expedition against Batavia, but which was afterwards sent to Egypt. On his return to India, he found that the star of Wellesley was in the ascendant; and B., who had already complained of the preference given to that officer, and who was, besides, of opinion that his own merits were constantly overlooked, applied for leave of absence, and sailed for Europe in 1803. He was received at court with great distinction, knighted in June, 1804, and made a K.C.B. in the following August. In 1805, he commanded an expedition against the Dutch settlements at the cape of Good Hope, which was successful; in 1807, he commanded a division at the siege of Copenhagen; and in 1808, was sent to Spain with an army of 10,000 men, to assist Sir John Moore. He distinguished himself in the battle of Corunna, Jan. 16, 1809. Moore having been killed in the action, Sir David succeeded to the chief command, and had the honor of communicating the intelligence of the victory to government. On this occasion he received, for the fourth time in his life, the thanks of parliament, and was created a baronet. After this period, he retired from active service. He d. Aug. 18, 1829.

BAIRD, ROBERT, D.D., 1798–1863; b. Penn.; a clergyman and author, graduate of Jefferson college in 1818. He passed several years in Europe, laboring especially for temperance and the revival and consolidation of evangelical Protestantism. He was agent and secretary of the American and foreign Christian union. Among his works are *Religion in America, A Visit to Northern Europe, Protestantism in Italy, History of the Albigenses, History of Temperance Societies in the United States,* etc.

BAIRD, SPENCER FULLERTON, LL.D., b. Penn., 1823; a naturalist, educated at Dickinson college, where he was professor of natural science. After being for a time assistant secretary of the Smithsonian institution, and became secretary in 1878, on the death of Joseph Henry. His works are a translation of the *Bilder Atlas* (in which he was assisted by others), published here as the *Iconographic Encyclopædia;* papers on natural history forming part of the *Reports of the Survey of Railroad Routes to the Pacific, The Birds of North America, The Mammals of North America,* and many papers in the scientific magazines.

BAIREUTH, a city, with a pop., in 1871, of 17,837, capital of the province of Upper Franconia, Bavaria, and formerly the capital of the principality of the same name. B. is beautifully situated on the Red Mayn, about 126 m. due n. from Munich. Its streets are broad and well paved, and are interspersed with groves, promenades, fine gardens, and public fountains. Its principal buildings are the old palace, the new palace, containing a gallery of paintings; the mint, opera-house, riding-school, infirmary, and town-hall. A magnificent new opera-house for the performance of Wagner's music, finished in 1875, was in the following year opened with a grand representation, lasting several days, of a new work by that composer. B.'s chief articles of industry are leather, cottons, woolens, linen, tobacco, parchment, and porcelain. Jean Paul Richter d. here in 1825, and a monument has been erected to his memory.

BAITOOL', or BETTOOL, a fortified t. of British India, in the presidency of Bengal, and territory of Saugor and Nerbudda, 50 m. n.e. from Ellichpoor.

BA'JA, a market t. of Hungary, in the circle of Bacs, on the Danube, celebrated for its annual swine-fair. Grain and wine, in large quantities, are produced in its neighborhood. Pop. '69, 18,110.

BA'JAN. See BEJAN.

BAJAZET', or BAJASID (pronounced Bayazet') I., Sultan of the Turks, was b. in 1347. In 1389, he succeeded his father, Murad I., who fell in battle near Kossova, fighting against the Servians. Immediately on ascending the throne, he inaugurated his rule, after the fashion of eastern kings, by strangling his younger brother Yacub, lest he should dispute the succession. In three years he conquered Bulgaria, a part of Servia, Macedonia, and Thessaly; he also subdued most of the states of Asia Minor. From the rapidity with which these extraordinary conquests were effected, he received the name of Ilderim—that is, Lightning. He even blockaded Constantinople itself for ten years, thinking to subdue it by famine. To rescue this city, king Sigismund of Hungary (afterwards emperor of Germany) assembled a large army, in which there were 2000 French nobles, under the command of the duke of Nivey. With this army, king Sigismund attacked the city of Nikopolis, in Bulgaria, situated on the Danube. B. hastened to meet him, and gained a decisive victory over the allied Hungarians, Poles, and French, on the 28th Sept., 1396. Sigismund escaped captivity only by a speedy flight in disguise; but the greater part of the French, through whose impetuosity the battle was lost, were taken prisoners, and were nearly all executed. B. would now have entirely destroyed the Greek empire, if he had not been prevented by Timur (q.v.), who attacked his possessions in Asia Minor, and completely defeated him on the 16th June, 1401, near Angora, the capital of what was anciently called Galatia, on the very spot where Pompey had formerly overthrown Mithridates. B. himself fell into the hands of the conqueror, who treated him with great generosity. The story that he was carried about imprisoned in a cage is without any historical foundation. B. died in 1403, in the camp of Timur. He was succeeded in the government by his son Soliman I. B. was honorably distinguished by his efforts to improve the administration of justice. During the 14 years of his reign, he built a large number of mosques, among others, one at Adrianople, and a second at Broussa, which two cities were then the ordinary residences of the Ottoman princes.

BAJAZET' II., son of the sultan Mohammed II., the conqueror of Constantinople, was b. in 1447, and ascended the Ottoman throne after his father's death in 1481. His reign, which lasted 32 years, was a succession of uninterrupted wars against Hungary, Poland, Venice, Egypt, and Persia, which were carried on with various success and without any events of striking importance, yet which served on the whole to establish the Ottoman power. The last years of his reign were much disturbed by disputes between his sons about the succession to the throne. Influenced by the preference shown by the janizaries for his younger son Selim, B. abdicated in his favor, but died before he could reach the place of his voluntary exile, in the neighborhood of Adrianople, in the year 1513. B. was a friend to the dervishes, at the same time liberal and fond of pomp and splendor. Many of the most beautiful mosques in Constantinople and Adrianople were built by him, and fitted up in a style of the greatest magnificence.

BA'JIMONT'S ROLL, the name given to a valuation, according to which the ecclesiastical benefices of Scotland were taxed, from the end of the 13th c. to the reformation. It took its name from an Italian churchman, Benemund or Baiamund de Vicci, who was sent from Rome by the pope about the year 1276, to collect the tithe, or tenth part of all the church livings in Scotland, for an expedition to the Holy Land. Hitherto, the Scotch clergy had been taxed according to a conventional valuation, called the *antiqua taxatio.* But Baiamund set this aside; and, in spite of their reclamations, assessed the benefices at their actual yearly worth, or *verus valor.* Although more than once referred to as an authoritative document in statutes of the 15th c., no complete copy of B. R., in its original shape, is now known to exist. A contemporary manuscript of so much of the roll as applies to the archdeaconry of Lothian, or that portion of the diocese of St. Andrews which lies to the s. of the Forth (comprehending the counties of Berwick, Haddington, Edinburgh, Linlithgow, and part of Stirlingshire), is preserved at Durham. The real value of the benefices in this district, as set down in B. R., exceeds the conventional value in the *antiqua taxatio* in the proportion of 420 to 286. A copy of B. R., as it appears to have existed in the reign of king James V. (1513–42), is preserved in the advocates' library at Edinburgh, in a hand of the beginning of the 17th century. It is full of inaccuracies; and it omits all livings of less than 40 marks a year. Of the *antiqua taxatio,* which was superseded by B. R., there are good copies in the handwriting of the 13th c., so far as concerns the benefices in the four dioceses of St. Andrews, Brechin, Aberdeen, and Moray.

BAJ'MAK, or BAJMOK, a large village of the Austrian empire, in Hungary, province of Bacs, 16 m. s.w. of Theresienstadt. Pop. '69, 6446.

BAJOC'CO, or BAIOCCO (pl. BAJOCCHI), was a copper coin in the Papal States, value nearly a half-penny. It was $\frac{1}{100}$th of the scudo, which was equal to 4*s.* 3½*d.* In the island of Sicily, the Neapolitan *grano,* the $\frac{1}{100}$th part of the ducato (= 3*s.* 4*d.*), was also called a bajocco.

BA'JUS, MICHAEL (properly, De Bay), one of the most distinguished theologians of the Catholic church in the 16th c., was b. in 1513 at Melun. He studied at Louvain, and became professor of theology there in 1550. He was present at the council of Trent in 1563, and also in 1564. He was the founder of a system of theology, based directly on the Bible and the writings of the Fathers, and setting aside the scholastic method. He had studied much the writings of St. Augustine, and therefore confined himself closely within the circle of ideas held by this father of the church, whose doctrines of the entire inability of the human will to do good, and the absence of merit in all good works, B. defended against the Jesuits. The assertions that the human will, so long as it is left to its own freedom, can do nothing but sin, and that even the mother of our Lord was not free from original and actual sin, together with other such doctrines, drew on him the accusation of heresy. Seventy-six of his propositions were condemned by a papal bull. B. submitted, but nevertheless did not give up his doctrines, and, in consequence, the persecutions to which he was subjected did not cease. He d. Dec. 16, 1589, having earned the reputation of great learning, pure manners, and singular modesty. He may be regarded as the predecessor of the Jansenists, who inherited his Augustinian views, which were at that time termed Bajanism. His writings, mostly of a polemical nature, were published by Gerberon (2 vols. Cologne, 1696).

BAJ'ZA, ANTON, a Hungarian poet and prose-writer, was b. Jan. 31, 1804, at Szücsi, in Hertes. His poems (2 vols. 1835), which were published in Pesth, earned for him a place among the best Hungarian lyric poets. In the *Kritischen Blättern*, to which he contributed from 1831 to 1836, the *Athenæum*, and the *Figyelmező* (Observer), to which he contributed from 1837 to 1843, in common with many of the best literary writers of the day, he exercised a beneficial influence on the rising literature of Hungary by his severe criticism, and his solid and theoretically correct essays. He likewise materially aided the Hungarian stage, then in its infancy, by the publication of the *Ausländischen Bühne* (Foreign Dramas, Pesth, 1830), and also by his exertions as director of the National Theatre, opened in Pesth on Aug. 22, 1837. At the same time, he had begun to occupy himself with historical studies, and enriched the literature of Hungary, very poor in this respect, with a *Történeti Könyetár* (Historical Library, 6 vols., Pesth, 1843–45), which contained translations from many excellent foreign historical works. He also published a compilation from the German, *Uj Plutarch* (The Modern Plutarch, Pesth, 1845–47). His *Vilagtörténet* (Universal History, Pesth, 1847) is a rather unskillful compilation from Schlosser, Heeren, Rotteck, and other German historians. After Mar., 1848, Kossuth appointed him editor of his half-official organ, the *Kossuth Hirlapja* (July till Dec., 1848), in conducting which, however, he displayed no great editorial talent. B. was made a member of the Hungarian academy in 1832. He d. Mar., 1858.

BAKALAHARI, one of the Bechuana tribes of Africa, in the Kalahari desert, s. of lake Ngami toward Orange river. They mingle with the Bushmen, and make some attempts at agriculture and traffic.

BÁKARGANJ, a district in India between 23° 14′ to 21° 48′ n., and 89° 55′ to 91° 5′ e., on the bay of Bengal; 4935 sq.m.; pop. 2,377,423. It is level, with not a single hillock, and full of tidal streams and marshes, but well cultivated. In the s. part are tigers, leopards, and other wild beasts. Of its population, 1,540,965 were Moslems, 827,393 Hindoos, 4049 Buddhists, and 4853 Christians.

BAKER, a co. in central Alabama, on the Coosa; 665 sq.m.; pop. '70, 6194—137 colored. Productions, corn, wheat, oats, cotton, and sweet potatoes. Intersected by two railroads. Co. seat, Grantville.

BAKER, a co. in n.e. Florida, on St. Mary's river; 570 sq.m.; pop. '80, 2,303—643 colored. Products, corn, sweet potatoes, sugar, and molasses. In the n. part is a portion of the Okefenoke swamp. Co. seat, Sanderson.

BAKER, a co. in s.w. Georgia, on Flint river, 1400 sq.m.; pop. '80, 7,305—5,565 colored. It has fertile soil, producing chiefly corn and cotton. Co. seat, Newton.

BAKER, a co. in s.e. Oregon, bordering on Nevada and Idaho; about 6000 sq.m.; pop. '80, 4,615—1,304 Chinese. It has gold and silver mines, and produces wheat, barley, etc. Co. seat, Auburn.

BAKER, EDWARD DICKINSON, b. England, 1811; killed in the battle of Ball's Bluff, Va., 1861. He came to this country when a child; studied and practiced law; was a member of the Illinois legislature, and in 1844 member of congress from that state; resigned, and volunteered in the Mexican war; commanded a brigade at the battle of Cerro Gordo; after the war, was again chosen congressman, but resigned, and in 1852 settled in California. Thence he went to Oregon, and was United States senator from that state. When the rebellion began, he raised a regiment in New York and neighborhood, was offered a commission as brig.gen. but declined it, and fell at the head of his favorite troops.

BAKER, OSMON CLEANDER, D.D., 1812–71; b. N. H.; a clergyman; educated at Wesleyan university; began his pastorate in 1844; in 1847 occupied the chair of theology in the Methodist Biblical institute at Concord, N. H.; was afterwards president of the

institution until 1852, when he was chosen bishop of the Methodist Episcopal church. He is author of a work on ecclesiastical law and polity of the church.

BAKER, Sir RICHARD, author of the *Chronicle of the Kings of England,* a book long esteemed and quoted on all matters of English history by the country gentry. Addison makes his model squire, Sir Roger de Coverley, refer to it frequently. Notwithstanding its reputation, however, among that class, the book had no lack of errors, and is now all but forgotten. Its author was born in Kent, or, according to other accounts, in Oxfordshire, about the year 1568. He was educated at Oxford university, and in 1603 was made a knight. About 1620 he married and settled in Oxfordshire, of which county he was made high sheriff; but he was soon after thrown into the Fleet prison for debt which his wife's family had contracted, but for which he had become responsible. Here he wrote his *Chronicle,* first published in 1641, besides several pious works of less note. He died in prison, in great poverty, in 1645.

BAKER, Sir SAMUEL WHITE, K.C.B., an African traveler, was b. in 1821. He is the son of Mr. Samuel Baker, of Thorngrove, in Worcestershire. B. was educated as an engineer, and at an early age went to Ceylon. There, led by the love of field-sports into the recesses of the island, he gave evidence of that love of adventure which was to make him famous as an explorer. In 1854, he published a work entitled *The Rifle and the Hound in Ceylon;* and in 1855, *Eight Years' Wandering in Ceylon.* B. afterwards superintended the construction of the railway which connects the Danube across the Dobrudscha with the Black sea. In 1860, B. married Florence, the daughter of F. von Sass, a young Hungarian lady of great talent and enterprise; and in company with her, he undertook a journey of exploration on the upper Nile. They set out from Cairo in April, 1861; and B. devoted his attention first to the Atbara and Blue Nile, the chief affluents of the Nile, which descend from the highlands of Abyssinia. In June, he arrived at the course of the Atbara, which was at that season dry, or marked only by a few stagnant pools. On the 23d, when the Abyssinian rainy season had set in, a noise like distant thunder was heard, and in a few seconds the river-bed had been converted into a torrent 20 ft. deep. Eight days later, it had become a great river, charged with mud, washed from the hills, which it carried down to the Nile, to cause the inundations and mud deposits of Egypt. B. reached Khartoum in June, 1862, and there he had an opportunity of contrasting the Blue and White Nile. He found the former, like the Atbara, to be a mountain torrent, rising and falling with the Abyssinian rains, but always free from deposits of mud. The White Nile did not thus rise and fall, and its water, never pure, had a disagreeable taste of vegetation, showing that it proceeded from lakes and marshes. When B., with his wife, quitted Khartoum to ascend the White Nile, he had in his pay an escort of 90 persons, 29 camels and asses, and three large boats. After passing through a wonderful region of forests and marshes, the travelers reached Gondokoro, a rendezvous of the traders of the interior. They had only been there a fortnight, when they were joined by Speke and Grant, who had penetrated into those regions from the south. Speke and Grant told B. of the Victoria N'yanza, which they had just discovered and explored, and that the natives had described to them another great lake, named Luta Nzige, which they had been unable to visit. B. resolved to reach this lake; and after a series of adventures, he and his wife arrived, on the 14th Mar., 1864, on the top of lofty cliffs, from which they beheld the vast inland sea, to which B. gave the name of the Albert N'yanza. In 1869, an expedition for the suppression of slavery in the interior of Africa was organized by the pasha of Egypt, under B.'s command. B. returned in 1873, and reported the success of the expedition. The resignation of his successor, col. Gordon, however, and the deposition of the Khedive in 1879, again led to a suspension of government control in the valley of the Nile. B. was knighted in 1866. In 1866, he published *The Albert N'yanza;* in 1871, *The Nile Tributaries of Abyssinia;* in 1874, *Ismailia,* an account of his expedition of 1869–73; and in 1879, *Cyprus as I saw it in* 1879.

BAKER, WILLIAM MUMFORD, b. 1825; a graduate of Princeton. He has written the life of his father, Daniel B.; *Inside, a Chronicle of Secession; The New Timothy; The Virginians in Texas,* etc. He has been a Presbyterian pastor in Texas and Ohio, and is now a pastor in Boston, Mass.

BAKERIES, ARMY. Armies have generally the means of obtaining soft or loaf bread, though not till recently could this be said of the British army. The French, ever since the time of Louis XIV., have been accustomed to take portable ovens with their armies; those now used will each bake 450 rations at once. Outside Sebastopol, in the winter of 1854, the British soldiers sometimes willingly exchanged with the French 3 or 4 lbs. of biscuit for 1 lb. of soft bread. The efforts since made to improve the sanitary condition of the army have included the establishment of traveling bakeries for field-service. Under the commissaries, the troops now rarely fail to obtain their daily rations of fresh-baked bread. We were last among the greater nations to make this obvious improvement; but the French depend more on bread and less on meat than the English; and this may partly account for the difference. The French soldiers are taught to construct field-ovens, and to bake their bread in camp, while government B. are established all over France, entirely conducted by soldiers. Among other lessons afforded by the siege of Sebastopol, was one relating to an improved supply of army-bread. Two screw-

steamers, the *Bruiser* and the *Abundance*, were sent out to Balaklava, one provided with machinery for grinding corn, and the other with machinery and ovens for making and baking bread. In each case the ship and the machinery were propelled by the same steam-engine. When quietly anchored in the harbor, the mill ground 24,000 lbs. of flour per day—better in quality, and cheaper than could have been obtained by contract. The bakery ship *Abundance* had four ovens of 14 bushels' capacity each; it baked in an excellent manner 6000 loaves of 3 lbs. each per day, which loaves were sent up to the siege-army as soon as cooled. The ships and machinery were sold when the war was over—a proceeding which the commissariat officers much regretted; but the experience thence obtained will not be lost. The improved arrangements suggested for meat-rations are noticed under COOKERY, ARMY.

BAKEWELL, a small but very ancient t. in Derbyshire, on the left bank of the Wye, near its confluence with the Derwent, and 24 m. n.n.w. of Derby. It lies on the slope of a hill, in the midst of very beautiful scenery, in a carboniferous limestone tract, and in the vicinity of black marble quarries, and of coal and lead mines. Its chalybeate springs and warm baths are much resorted to. The celebrated Arkwright first established cotton-mills here. On the opposite bank of the Wye are the traces of a castle built by Edward the Elder in 924. B. is now the property of the duke of Rutland, whose seat is Haddon hall, two m. from the town. B. is a center for visiting the fine scenery of North Derbyshire and the Peak; and the streams in the vicinity are much resorted to by anglers. It contains a spacious cruciform church, founded in Saxon times, and showing specimens of ecclesiastical Gothic architecture of three different periods. The special industry of B. is the turning, polishing, and inlaying of the local marble. Pop. '71, 2283.

BAKEWELL, ROBERT, a celebrated agriculturist, was b. in 1726 at Dishley, in the co. of Leicester, and d. in 1795. He does not appear to have written anything, even upon the subjects with which he was so well acquainted, so that his fame rests entirely upon his successful efforts to improve the breed of domestic animals. His reputation was so great as a breeder of sheep, that he is said to have received the fabulous sum of 400 guineas for one season of a ram. The long-horned breed of cattle which he introduced is still known as the Dishley or New Leicestershire breed. His horses were also famous, and almost as profitable to him as his sheep. One of his objects was to produce a breed of animals that would fatten on the smallest quantity of food.

BAKHTEGAN', a salt-lake of Persia, province of Farsistan, from which remarkably fine salt is obtained. Its size is variously stated—some writers making it 60 m. in length, with an average breadth of 8 m.; others, only 70 m. in circumference.

BAKING is the mode of cooking food in an air-tight chamber or oven. The term is also applied in the manufacture of bricks (q.v.), porcelain (q.v.), etc. The B. of bread will be treated under BREAD. The oven attached to kitchen-grates for cooking is simply an iron chamber, with flues for conveying the heated gases of the fire round it. In B., strictly so called, the oven is kept close, so that the steam and aroma arising from the inclosed substances are confined; but by opening ventilators a current of air is produced, and then these ovens may be used for what is called *oven-roasting*. The rank taste that often characterizes baked dishes is thus avoided. Ovens are now often heated by water, or by steam, and also by gas. Meat for B. is placed in a dish, from the bottom of which it is raised on a wire frame or trivet. In M. Soyer's B.-dish, a wire frame rests on the edge of the dish, and on this potatoes are laid; a trivet, rising above the frame, supports the meat; while the bottom of the dish contains a Yorkshire pudding; the dripping thus falls upon the potatoes and pudding below.

B., although a convenient mode of cooking, is not considered quite so good as roasting (q.v.). The practice of having recourse to the baker's oven, saves both trouble and expense in heating, and is a matter of necessity with those who have not means of cooking at home; but it has this chief objection, that every dish becomes impregnated with the steam and odors of all the rest. Soyer pronounces it to be semi-barbarous.

BAKO'NY WALD (forest of Bakony), a densely wooded mountain-range of Hungary, s. of the Danube, dividing the great and little Hungarian plains. Immense herds of swine are annually driven hither to feed upon the mast of the forest. The keepers of these swine furnished those notorious robbers who play so important a part in the ballads of the Hungarian people, and in the imagination of travelers. The saintly king Stephen founded a cloister in the forest 1030 A.D. Only in recent times has this dangerous territory been thoroughly explored. The hills have an average height of 2000 ft., with quarries of valuable marble, in which a considerable export trade is done.

BAK'SHISH. The ordinary meaning of this word in Persian is a present; but in the east, in modern times, it has acquired the special signification of gratuity (Ger. *Trinkgeld*), which, however, the orientals do not quietly wait to receive, but demand loudly, and even insolently. Every traveler, whether in Turkey or in Egypt, in Asia Minor or in Syria, if he receives the smallest service from any one, is immediately reminded by the cry of "Bakshish, Bakshish," to pay for the courtesy by a gift of money. Even when the ambassadors to the supreme porte obtain an audience from the sultan, or from any of the high dignitaries, they are obliged, by the prompt gift of a B., to avoid a peremp-

tory demand for it on the part of the door-keepers and other servants. By degrees, the B. has been fixed by custom at certain sums.

BAKTSHI-SERAI' (the "City of the Gardens"), the residence of the ancient princes or khans of the Crimea, stands in a deep limestone valley, not far from the present capital, Simferopol. The city is kept in excellent repair, and had a pop. in 1867 of 11,448, consisting almost exclusively of remnants of the old Tartar inhabitants. It thus presents a striking contrast to the modern towns of the Crimea, and is one of the most singular in Europe. The palace of the ancient khans has been completely restored by the Russian government in the oriental style. It consists of a great labyrinth of buildings, courts, and gardens, and is situated about the middle of the town, dividing it into two parts. The chief manufactures of the place consist of articles of copper, Turkish saddles, and silk.

BAKU', a seaport t. of the Apsheron peninsula, in the Caspian sea. It is under the dominion of Russia, and contains (1867) 12,383 inhabitants, chiefly Persians and Armenians. The whole soil around B. is impregnated with naphtha, which forms an important branch of its industry. Some of the fountains ignite spontaneously, and this natural phenomenon has caused B. to be esteemed as a holy city by the Parsees or fire-worshipers, many of whom resort to it from very long distances. B., besides its trade in naphtha, exports cotton, silk, opium, saffron, and salt. The Arabian, Masudi, is the first who mentions B., about 943, and he gives an account of a great volcanic mountain in its vicinity, which is now extinct. B. was ceded by the Persians to the Russians in 1813. Capt. Baker states that the refuse of the oil drawn from the wells is, after the naphtha has been distilled from it, used now with great success as a substitute for coal in the steamers on the Caspian sea. The harbor, which is strongly fortified, is one of the chief stations of the Russian navy in the Caspian, and is also of great importance as a center of trade. A good deal of ship-building is carried on. B. is capital of a government of Russian Transcaucasia, with a pop. (1871) of 513,560.

BA'LA BEDS, a local deposit, occurring in the neighborhood of Bala, in North Wales, and forming a group in the lower silurian of Murchison. They consist of a few beds, rarely more than 20 ft. in thickness. The beds are chiefly composed of hard crystalline limestone, alternating with softer argillaceous bands, which decompose more freely, and leave the limestone like a cornice molding, affording a characteristic by which, at a considerable distance, the B. B. can be distinguished from the rocks of hard gritty slate above and below. Trilobites and cystideæ are the predominant fossils of the group. Calcareous beds, containing similar fossils, have been noticed in the silurian district of the s.e. of Ireland, and referred to this group.

BA'LAAM, the name of a prophet who figures prominently in the early history of the Israelites. He is first mentioned in Numbers xxii. 5, where Balak, king of the Moabites, alarmed at the irruption of the chosen people into his territories, is represented as sending messengers to Pethor, in Mesopotamia, the dwelling-place of the seer, to beseech him to come and curse the invaders. The narrative is, of course, familiar to every one, and it is therefore unnecessary to recount it; but it is marked by two peculiarities, which have excited much speculation and controversy. The first is the admittedly prophetical character of B., who was a *Gentile;* the second is the curious miracle in the case of his ass. With regard to the supernatural powers attributed to B., the most prevalent hypothesis is, that he was the last relic of the patriarchal age, during which communion with God was not formally restricted to one race, but diffused more or less among all the Semitic peoples. Some, again, suppose that his knowledge of God, from whom he apparently received miraculous communications, was derived from traditions of the primitive faith, scattered over Mesopotamia by Abraham, Jacob, Laban, etc.; though Hengstenberg conceives that he had been led to renounce idolatry by hearing of the miracles which attended the exodus of the Israelites, anticipating, as a reward for his change of worship, a further insight into futurity, and a greater power over nature. B. has ever been considered a type of those men who prostitute their powers and hold the truth in unrighteousness, receiving the wages thereof.

BALÆ'NA. See WHALE.

BALÆNOP'TERA. See RORQUAL.

BALAGHAT' DISTRICTS, the name given to a large tract of elevated country in the s. of India, 28,669 sq.m. in area, and extending from the rivers Tumbuddra and Krishna in the n. to the furthest extremity of Mysore in the south. Part of the ancient Hindu kingdom of Carnata, it was conquered by the Mohammedans, and fell into the hands of the British on the final overthrow of Tippoo (q.v.). The name Balaghat signifies *above the ghauts.*

BALAKLA'VA, a small port in the s.w. of the Crimea, separated by a rocky peninsula from the harbor of Sebastopol, from which the direct distance is about 6 miles. Pop. in '67, 742. The harbor, which affords secure anchorage for the largest ships, is perfectly landlocked, the entrance being so narrow as scarcely to admit more than one vessel at a time. To the e., overlooking the bay from a rocky eminence, are the ruins of a Genoese fortress. The foundation of the work is excavated into numerous chambers and galleries. It is the *Symbolon Limen* of Strabo; and the present name is supposed by

Dr. Clarke to be a corruption of the Genoese *Bella-chiava*, or Fair Haven. This was long the seat of a Greek colony; in the 14th c., it fell into the hands of the Genoese; about the end of the 15th, they were expelled by the Turks; and on the conquest of the Crimea by Catherine II. of Russia, it was made a military station for a regiment of Greeks and Albanians. In 1854, a few days after the battle of Alma, the town was occupied by the British army under lord Raglan, and the harbor formed, during the ensuing campaign, the head-quarters of the fleet, and the basis of operation of the army. Here ensued those scenes of mismanagement and confusion that have rendered B. a synonym for chaos, and the recital of which, with the resulting privations and misery to the soldiers, stirred so terribly the heart of England in the winter of 1854–55. A terrible hurricane on Nov. 14, 1854, in which 9 vessels were totally destroyed, and several others seriously injured, tended greatly to increase the confusion which incapacity and divided responsibility first occasioned at Balaklava. Soldiers, 6 m. distant, were dying for want of food, clothing, and medicine, which were hidden hopelessly beyond reach in store-rooms at B., or stowed away in the holds of ships that were not permitted to enter the harbor. Transport vessels, for which the country was paying enormous sums of money daily, were kept lying idle in port with their most anxiously awaited cargoes (for lack of which the troops were perishing by hundreds) unladen, while poor mutilated and dying soldiers lay miserably exposed on the heights for want of ships to convey them to the hospitals at Scutari. The rebuilding of the greater part of the town, the formation of a line of railway between B. and the camp, and certain official investigations in 1855, completely remedied this disgraceful state of things. The 25th of Oct., 1854, was signalized, on the height between the town and the Tchernaya, by those unparalleled cavalry charges, the record of which is among the saddest but proudest memories of the British army. See Kinglake's *Invasion of the Crimea* (5 vols., 1863–75), of which nearly the whole of the fourth volume is devoted to a minute account of the events connected with Balaklava.

BALANCE (of doubtful derivation), an instrument for ascertaining the weight of bodies in grains, ounces, pounds, or any other units of weight. The ordinary B. consists of a lever called a beam, whose point of support is in the middle of its length, and having dishes or scales suspended from either extremity. As it is of importance that the beam should move easily round its point of support, it rests on polished agate or steel planes, by means of knife-edges of tempered steel, which project transversely from its sides, and serve as the axis of rotation. By this arrangement, the surface of contact is reduced to a mere line, and the friction of the axis of the beam on its support almost entirely obviated. The scales are hung by means of chains attached to steel hooks, which rest also on knife-edges, but turned upwards instead of downwards, as in the first case. The essential requirements of a B. of this description are: 1st, That the beam shall remain in a horizontal position when no weights are in either scale; and 2d, That the beam shall be a lever of equal arms, or have the distances between the central knife-edge and those at either end exactly the same. To insure the first of these conditions, it is necessary that the center of gravity of the beam lie vertically below the point of support, when the beam is horizontal. When such is the case, the center of gravity at which the weight of the beam may be considered to act, oscillates as in a pendulum round the point of support, and always comes to rest right under that point, thus restoring to the beam its horizontal position when it has been tilted out of it. If the center of gravity were above the point of support, the beam would topple over; and if it coincided with that point, there being no restoring force, the beam would occupy indifferently any position into which it was thrown, the B. in both cases being useless. That a B. possesses the second of the above conditions, is ascertained by putting weights into the scales which keep the beam horizontal, and then transposing them, when, if it still remain so, the lengths of the arms are equal. Should the arms be of different lengths, a less weight at the end of the longer arm will balance a larger weight at the end of the shorter arm (see LEVER); but when transposed, the larger weight having the longer arm, and the smaller weight the shorter, the beam can no longer remain horizontal, but will incline towards the larger weight. A balance with unequal arms is called a false B., as distinguished from an equal-armed or just balance. When weighing with a false B., it is usual to weigh a body in both scales, and take the arithmetical mean—that is, half the sum of the apparent weights for the true weight. This is near enough to the truth when the apparent weights differ little from each other; but when it is otherwise, the geometrical mean (q.v.) must be taken, which gives the exact weight in all cases.

Although the preceding conditions are of essential importance, they do not supply all that we look for in a good balance. It is necessary, in addition, that the beam should turn visibly from its horizontal position when there is a slight excess of weight in the one scale as compared with the other. This tendency is termed *sensibility*, and depends upon the weight of the beam, the position of its center of gravity, and the length of its arms. Let ABD (fig. 1) represent the beam of a balance, C the point of suspension, G the center of gravity, and ACB the straight line joining the knife-edges, which may be taken as the skeleton lever of the balance. We shall here confine our attention to that construction where the three knife-edges are in a line, because it is the most simple and

at the same time the most desirable. We may, without altering the principles of equilibrium, consider the beam reduced to the lever AB, and embody its weight in a heavy point or small ball at the center of gravity, G, connected with C by the rigid arm CG. The scales (represented small in the fig. for the sake of space), with the equal weights in them being at an equal distance from C, have their center of gravity in that point; and their combined pressure acting there, is not directly by the supporting plane, so that they have no influence in determining any particular position of the beam. If a small weight, p, therefore, be put into the scale at B, the position of the beam is determined by its rotating tendency (moment) round C, and the counter-rotating tendency of the weight of the beam, W, acting at G. The question of sensibility is thus reduced to the action of the crooked lever GCB, with p acting at one end, and W at the other. The relations of the arms and forces of a crooked lever will be found under LEVER. It is only necessary here to state that the moment of the weight acting at the end of a crooked lever increases with its size, the length of its arm, and the smallness of the angle which that arm makes with the horizontal line passing through the fulcrum. Let us suppose that, under the effect of the opposing moments, the beam, as represented by the line AB, takes up the position marked by the dotted lines. If, now, we were to lengthen CB′, and keep CG′ as it is, CG′ would rise nearer to the horizontal line, and CB′ fall further from it, before equilibrium would be restored; and the inclination of CB′, or the beam to the horizontal line, thus being greater, the sensibility of the balance would be increased. Consequently, *the longer the arms of a B. are, all other things being the same, the greater will be its sensibility.* But the same object would be reached by keeping CB′ its original length, and shortening CG′, or bringing the center of gravity of the beam nearer to the point of support. The weight of the balance then having a shorter arm, the point G′, for the same reason as before, would need to rise higher, and B′ sink lower, before A′B′ would find its position of rest. Here, also, *the nearer the center of gravity of the beam is to the point of support, the greater will be the sensibility of the balance.* If now, however, we keep the length of the arms CG′, CB′ constant, but diminish the weight acting at G′, while p acting at B′ remains the same, it is manifest that to make up the deficiency in the weight W, the two arms will turn to the left, as in the preceding cases, so as to give W a longer and p a shorter *effective* arm. The smaller, therefore, the weight acting at G, or *the smaller the weight of the beam, the greater will be the sensibility of the balance.*

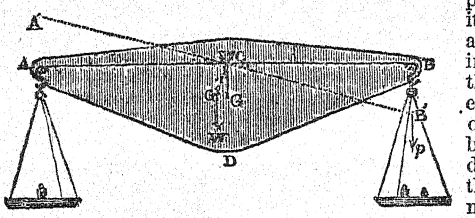


Fig. 1.

In the construction of the B., it is a matter of importance to have the sensibility independent of the amount of weight in the scales, so that, when heavily loaded, a small weight will produce the same inclination as when not loaded at all. This condition is implemented, as we have already shown, when the three knife-edges are kept in the same straight line. If the line joining the two terminal knife-edges lie below the point of suspension, then the center of gravity of the equal weights corresponding with the middle of that line, will, upon the turning of the beam, be forced from below that point, and will accordingly have a tendency to resume its former position. The equal weights thus counteract to some extent the effect of the additional weight, in causing the beam to incline, and their influence in this way will be all the greater as they themselves increase. When a B. is too heavily loaded for its strength, the three knife-edges, although previously in a line, do not retain that position, for the arms of the beam yielding to the pressure, cause the terminal knife-edges to sink below the one in the middle, and the knife-edges themselves losing their shape under the pressure, the sensibility is considerably diminished.

When a B. is very sensible, the beam keeps oscillating for a considerable time from one side to the other of the position in which it finally settles. Although such an instrument may be useful for physical and chemical experiments, it is not serviceable for the purposes of ordinary life, where minute quantities of the substance to be weighed are of little value, and where time, and consequently rapidity of indication, are matters of importance. The sensibility of a B. must, therefore, be adjusted to the purpose for which it is designed; sensible balances being employed for weighing finer, and less sensible, or *stable* balances, for weighing coarser materials. The stability, or the tendency of the beam to come quickly to rest, depends on requirements nearly the opposite of those which conduce to sensibility. In the construction treated of above, the stability increases with the moment of the weight of the beam acting at G round C, so that it thus increases with the weight of the beam, and the distance of the center of gravity from the point of suspension. The stability is also increased, as already shown, by having the line joining the scale knife-edges below the point of support.

There is another form of delicate balance employed in physical and chemical researches. The beam is constructed so as to combine lightness with strength, and rests by a fine knife-edge on an agate plane. It is surmounted by a weight moving on a screw, so that the sensibility may be increased or diminished, according as the weight is raised or

depressed. In order that the knife-edge may not become blunted by constant contact with the supporting plane, a cross-bar, with two projecting pins, is made to lift the beam from the plane, and sustain its weight when the balance is not in play. The beam is divided by lines marked upon it into 10 equal parts, and a small weight made of fine wire bent into the form of a fork, called a rider, is made to slide along to any of the divisions. If the rider be, for instance, $\frac{1}{10}$ of a grain, and if, after the weight of a body is very nearly ascertained, it brings the beam, when placed at the first division next the center, exactly to its horizontal position, an additional weight of $\frac{1}{100}$ of a grain will be indicated. The use of inconveniently small weights is, by this arrangement, to a large extent obviated. As the beam takes some time before it comes to rest, it would be tedious to wait in each case till it did so, and for this reason a long pointed index is fixed to the beam below the point of suspension, the lower extremity of which moves backward and forward on a graduated ivory scale, so that when the index moves to equal distances on either side of the zero point, we are quite certain, without waiting till it finally settles, that the beam will be horizontal. The same is seen in ordinary balances, only the tongue or index is above the beam; and according to its deviation on each side of the fork or cheeks by which the whole is suspended, is the future position of the beam ascertained. The finer balances are never loaded to more than a pound in each scale, and when so charged, will deflect with $\frac{1}{100}$ of a grain of additional weight in one of the scales, or will turn, as it is technically called, with $\frac{1}{1120}$ of the load. The finest balances turn with $\frac{1}{1000000}$ of the load, and some have been constructed which turn with much less. Even with the best achievements of mechanical skill, no B. can be made whose arms are absolutely equal; and to remedy this defect, the method of double-weighing is resorted to, when the utmost accuracy is demanded. This consists in placing the body to be weighed into one scale, and sand, or the like, into the other, until exact equilibrium is obtained, then removing the body, and putting weights or another body in its place which exactly counterbalance the sand. Both being thus weighed in precisely similar circumstances, must weigh precisely the same.

The Roman B., or *steelyard* (Ger. *schnellwage*), is more portable than the ordinary balance. It consists of a lever AB, moving round a knife-edge or point at C. The body to be weighed, W, is put into the scale which hangs from A; and a movable weight, P, is made to slide along the longer arm, until the lever AB remains horizontal. The weight of W is then read off from the division at which P rests. If the lever lie horizontal when unloaded, then equal weights at equal distances from C will balance each other, so that when W is balanced by P at a distance from C equal to AC, the two are of equal weight; but if equilibrium take place when P, say, is ten times as far from C as A is, then W will be ten dimes the weight of P; and the same holds for any intermediate point at which P may stand, W weighing as many times P as P's arm is a multiple of W's arm. To weigh a body of 10 lbs. by the ordinary B., a counterweight of 10 lbs. is necessary, making a total load of 20 lbs.; but in the case just supposed, 1 lb. balances 10, making a total load of only 11 lbs. The steelyard has, therefore, this advantage over the common B., that the load on the fulcrum, and consequently the friction, is less. On the other hand, however, there is this disadvantage, that the arms of the steelyard bend unequally under the strain of great weights, which in a B. with equal arms cannot, to the same extent, take place. As the steelyard is ordinarily made, the longer arm preponderates when the lever is unloaded, so that the graduation of the longer arm begins at a point between A and C, and not at C. The *Danish B.* differs from the ordinary steelyard in having the weight fixed to the extremity of the lever, and the fulcrum movable.

The *bent lever B.* (Fr. *peson*, Ger. *Zeigerwage*), shown in fig. 2, is a lever of unequal arms, A, C, B, moving round the pivot C, having a scale, Q, attached to the shorter arm, AC, and a fixed weight, W, to the longer arm CB. The longer arm ends in a pointer moving in front of a fixed graduated arc. When a body is put into the scale, the pointer rises from the bottom or zero point of the arc, and rests opposite the mark corresponding to the weight of it. The higher the weight W rises, the longer becomes its *effective* arm, and the greater must be the weight it balances. The arc is generally graduated experimentally, the geometrical graduation being somewhat complicated.

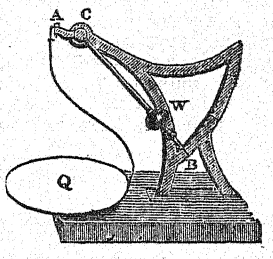


Fig. 2.

For other weighing apparatus, see SPRING-BALANCE; WEIGHING-MACHINES.

BALANCE AND BALANCE-SPRING. The balance of a watch is a wheel finely poised on its axis; the pivot-holes in which it turns being frequently—in chronometers and clocks, as well as in watches—jeweled, or made of small rubies, diamonds, etc., for the sake of durability. The natural effect of an impulse given to such a wheel would be a complete rotation on its axis. This, however, is convertible, by the escapement (q.v.), and by the balance-spring, into a vibratory motion. The balance-spring is held to be a crowning invention in the mechanism of the watch; and the honor of its first suggestion has been claimed for no less than three very eminent men—for Dr. Hooke, an Englishman; for Abbé Hautefeuille, a Frenchman; and for Hüyghens, the Dutch astronomer. The honor, however, undoubtedly belongs to Hooke.

The balance-spring consists of a coil of steel-wire, so delicately manufactured that 4000 of them scarcely weigh more than one ounce, though often costing more than £1000. In its application to the balance of a watch, one of the extremities of the spring is fastened to a point independent of the balance, while the other is attached near its axis. When the balance is at rest, the spring is inclined neither way, this position being called the point of rest; but when the impulse is given to the balance by the crown-wheel of the escapement, the balance moves round just so far as the impulse given is able to overcome the elastic resistance of the spring. When that resistance becomes equal to the impulse given, the balance stops for a moment, and then is driven back by the elastic recoil of the spring, and continues thus to vibrate so long as the impulse is repeated or the watch is in motion.

The recoil of the spring is sufficient to drive back the balance to a distance nearly double the length of its first motion; this is, therefore, called the long arc of vibration. But when the motion of the balance is free, with a certain length of spring, the *long* arc of vibration is made in less time than the short one, to which the impulse is given: with a spring of greater length this relation is reversed; whence it was concluded by Le Roy and Berthoud, that equality of time, or *isochronism*, in unequal vibrations, could be more easily obtained by lengthening the spring than by tapering it. In England, where time-keepers have been brought to their greatest perfection, it is considered that isochronism is most easily attainable by using the cylindrical helical spring, which is applied to all marine chronometers.

An improvement in watches, or rather in chronometers, invented by Mr. Dent of London, consists in coating the balance and balance-spring with gold by the electro-metallurgic process, by which means they are secured from rust.

BALANCE OF POWER, an expression used in diplomacy for that state of matters in which no one of the European states is permitted to have such a preponderance as to endanger the independence of the others. This idea is not, as some say, confined to modern times. The Greek states acted upon it by a kind of instinct of self-preservation, though it was not directly formulated. It has, however, become more distinctly avowed as a motive of political conduct, and more systematically acted upon since the time of Charles V., whose overgrown power and ambitious designs awakened the other European powers to the danger of such overwhelming preponderance in one state. The motive of preserving the B. of P. came first distinctly into the foreground in those unions which England, Holland, and Austria repeatedly formed against the menacing schemes of Louis XIV., for acquiring the dominion of all Europe. It was the same cause that broke up the most dangerous (for Louis) of these coalitions; for in the war of the Spanish succession, when the Hapsburg pretender to the Spanish throne became, by the death of Joseph I., sovereign of Austria and emperor of Germany, and the power which, in the hands of Charles V., had menaced the equilibrium of Europe, was thus likely to be again wielded by one man, England withdrew from the coalition, and thus saved Louis from a decided overthrow. The aggressions of Napoleon called all the powers of Europe to arms against him in the name of the B. of P.; and in readjusting the map of Europe, the B. of P. was often invoked to cover the jealousy which resisted not a few claims to restitution of territory. For some time, the B. of P. in Europe has been embodied, as it were, in a pentarchy or permanent congress of the five great powers, who mutually watch one another's movements. This mutual jealousy among the leading powers on the score of extension of boundaries, is looked to as the great safeguard of the smaller states, preventing their absorption by their powerful neighbors. It was the dread of a coalition against him that made the emperor of Russia agree to the treaty of 1841, and the Crimean war arose out of Russia's renewed attempt to extend her dominion over Turkey. Latterly, the doctrine of non-intervention has to a certain extent gained ground among politicians; and the formation of the kingdom of Italy, the results of the Franco-German war of 1870–71, and the formation of the German empire have modified the old ideas, and brought into play new combinations whose results can hardly yet be foreseen.

BALANCE OF TRADE. In the "mercantile system" of political economy, which looks upon the possession of gold as the grand aim, it not unnaturally came to be a maxim that a nation becomes richer just in proportion as the money value of its exports exceeds that of its imports; the excess, it was thought, being paid in gold, is just so much added to the national wealth. Now, the difference between the money value of the exports and imports of a state is called the "balance of its trade;" and by the adherents of the mercantile system, this balance was said to be "in favor" of the country or "against" it, according as the exports or the imports showed the excess.

But this view of the matter rests on a twofold error; for, in the first place, the increase of national wealth is by no means to be identified with the immediate influx of hard cash; nor is gold the highest expression of national wealth, but only a means of turning real wealth and the faculty of labor to account. Further, the assumption that excess of exports represents excess of income, is completely false. It takes exports for income (because payment is received for them), imports for expenditure (because they must be paid for), while it would be more consistent with the truth to say that exports are identical with expenditure, and imports with income; so that wealth increases in pro-

portion as the value of the imports (what is received) exceeds that of the exports (what is given away); and that whether these exports and imports consist solely of goods or partly of money. It may sometimes be desirable to get payment of exports in gold—that is, to import bullion. But the case in which this will be beneficial to the merchant seeking his own profit in the transaction, will be that in which it will be beneficial to the community. In the majority of cases, however, the individual merchant finds it his best policy to lay out the money due to him in a foreign country in purchasing the wares of that country as return-value. The far-sighted Venetians early recognized the truth of the principle in a national point of view; for, by a law of 1272, they laid a tax of one fourth the value on the importation of all coined gold and silver. The mercantile system of political economy, on the contrary, consistently following up the notion of the B. of T., enacted laws prohibiting importation of foreign manufactures, or imposing high duties upon them, and giving premiums and other protective encouragements for exportation; as if it were possible to go on exchanging always for gold only—ever exporting goods and goods alone, and never importing any. If this could be, and if it were true that a nation with the B. of T. constantly in its favor must become richer, while, with that balance against it, it must become poorer, England, whose official returns have for many years exhibited a large excess of exports over imports, must have had at this time about £500,000,000 in precious metals, while in reality the amount does not exceed perhaps £60,000,000. The truth is, that no safe conclusion can be drawn from the B. of T. exhibited in official statements; from the way in which they are arrived at, a great part of the facts of the cases are necessarily left out. Almost all nations exhibit favorable balances, and how could that be possible, if the whole affair were not deceptive? In the regular legitimate commerce between two nations, both actually gain, though the gain may not be exhibitable in the form of a money-balance. If the gains of nations from commerce consisted of differences between the amount of exports and of imports to be compensated by balances in money, nearly all nations would be yearly receiving accessions of gold and silver, the united amount of which would exceed, by more than ten times, the produce of all the mines in the world.

BA'LANUS, a genus of *cirrhopoda* (q.v.); the type of a family, including all those cirrhopods which are destitute of a flexible stalk, and of which the shell is symmetrical. These characters at once distinguish them from barnacles (q.v.). In the genus B. the base is usually formed of a thin calcareous plate, the sides of six valves; and four small valves form the operculum, exactly closing the aperture at the top. The name (signifying an acorn) was originally given by the ancient Greeks, from a supposed resemblance of some of the kinds to acorns; and acorn-shell has sometimes been adopted as an English name. There are many species, and they are found in almost all seas, attached to stones, timber, shells, crustaceans, etc. They cover the rocks between high and low water-mark on many parts of the coast as with a white calcareous incrustation, so that arithmetic fails in computing, and imagination in conceiving their multitudes. They may, however, be readily passed over as individually objects of little interest when they are seen after the tide has left them, for then their valves are closed, and they exhibit no sign of life; but if observed in a pool of the rocks, or anywhere under water, they present a very different and extremely pleasing spectacle, the opercular valves continually opening and shutting with a quick but pretty regular motion, and an exquisitely delicate apparatus of feathery arms or cirrhi (see CIRRHOPODA) being as frequently thrown out and retracted like a hand or a little net, to seize and carry into the mouth the minute nutritious particles or very small animals upon which the creature feeds. Thus, the little balani, immovably fixed to the rock, or carried about at the pleasure of mollusks or crustaceans to which they adhere, obtain their food from the waters around them.

A remarkable fact in the natural history of these creatures has recently been discovered by Mr. Thompson of Cork, that in the earlier stages of their existence they are not fixed as in their adult state, but move about very actively in a succession of bounds, by means of swimming-feet like those of the *cyclops* (q.v.); having, however, a shell, apparently of two valves, resembling a very minute muscle. Still more remarkable is the discovery made along with this, that in their early locomotive state they possess large stalked eyes, which disappear along with the organs of locomotion when they attach themselves—probably by the guidance of some peculiar instinct—to their final place of repose, undergoing a transformation into perfect cirrhopods, and acquiring as a covering their many-valved shell.

Some of the larger species of B. were esteemed a delicacy by the ancient Romans. The Chinese entertain the same estimation of *B. tintinnabulum*, which is said to resemble lobster in taste; and *B. psittacus*, a South American species, which is in like manner compared to crab, is exported in large quantities from Concepcion de Chili to Valparaiso and Santiago. This species is sometimes almost 4 in. in diameter, the height considerably more. It is chopped off the rocks with a hatchet. The two posterior opercular valves are beaked, from which it receives the name of *pico*, and its scientific trivial name, *psittacus* (a parrot).

BALASINORE', or BALASINESHWAR, a petty native state, or *jaghire*, of India, in the province of Guzerat, protected by the British government, and politically connected with the presidency of Bombay. It extends from n. lat. 22° 53′ to 23° 17′, and from e. long. 73°

17′ to 73° 40′, and contains an area of about 80 sq. miles. The river Mahi flows through the jaghire. The native ruler is styled nawab of Balasinore. He has a revenue of 41,548 rupees, of which he pays 10,000 rupees as tribute to the British government. The pop. of B. is estimated at 41,984. The nawab maintains a force of only 8 horsemen and 50 foot-soldiers, who are employed in revenue, police, and other services. The capital of the jaghire also bears the name of Balasinore. It is rather a thriving t. and is surrounded by a wall. It is 51 m. n. from Baroda.

BALASORE', a seaport in the district of Cuttack and presidency of Bengal, near the Boorabullung, which enters the sea to the w. of the Hoogly or Calcutta river. It is situated in lat. 21° 30′ n., and long. 87° e., and has dry-docks and a coasting-trade; but it is entitled to notice chiefly in connection with the past, having been the seat, successively, of Portuguese, Dutch, and Danish factories. It was only in 1846 that the Danes sold their interest in the place to the English.

BA'LATON, LAKE OF (Platten-See), a lake, the largest in Hungary, about 55 m. s.w. of Pesth. Its extreme length is 48 m., with a breadth of from 3 to 10 m., and an estimated area, including its frequently submerged marshes, of 420 sq. miles. Its greatest depth is 39 feet. It is supplied by upwards of 30 streams—the chief of which is the Szala—as well as by numerous springs which rise on its margin. Its outlet is by the Sio, which discharges itself into the Sarvitz, a feeder of the Danube. The waters of B. are clear and transparent, except when they are agitated by a storm, when they assume a bluish color. They have a slightly brackish taste. Fish of various kinds are found in abundance, and sand impregnated with iron, interspersed with which are small garnets, rubies, and other precious stones, is taken from it. Woods and vineyards cover the hills which encircle its northern sides, and on its banks near the t. of Füred there is a spring of acidulous water. The surrounding country is rich in rare plants and mineral treasures, and was the scene of several bloody conflicts during the Hungarian war (1848–49). The lake itself figures prominently in the old romantic ballads of the Magyars.

BALAUSTA. See BERRY.

BA'LAY, or BA'LAIS, the name now used to distinguish the ruby of a bright rose-color from the ruby proper, which is of a bright red or cochineal color, and from the *spinelle* ruby, which is of a red hue approaching to rose-color. This last kind of ruby has been recognized only in times which are comparatively modern. In the middle ages, they seem to have known only the B. ruby and the ruby proper, or *le beau rubis*, as it was often called. M. de Laborde thinks that the term B. was anciently employed as a name for all sorts of rubies.

BALBI, ADRIANO, well known by his geographical, and more especially by his statistical works, was b. in Venice on the 25th of April, 1782. In 1808, he gained so much credit in Italy by his first geographical work, that he was appointed professor of geography in the college of San Michele at Murano, and in 1811 professor of physics in the lyceum at Fermo. Subsequently he resided for a time in Portugal, and then went to Paris, to superintend the publication of his *Essai Statistique sur le Royaume de Portugal et d'Algarve* (2 vols., Par., 1822). This work was soon followed by the *Variétés Politiques et Statistiques de la Monarchie Portugaise* (Par., 1822). B. lived in Paris till 1832. He was the intimate friend of Malte Brun, from whose papers he, jointly with Larenaudière and Huot, published the *Traité Elémentaire de Géographie* (2 vols., Par., 1830–34). He also published several works of comparative national statistics. His *Atlas Ethnographique du Globe* (Par., 1826) is distinguished by its extensive accumulation of facts and views, giving an account of German researches on the subject, and entering into questions of comparative philology. B.'s best known work is, however, the *Abrégé de Géographie* (3d ed., Par., 1838), which has been translated into several languages. In the year 1832 he returned to Italy, and settled at Padua, where he died 14th Mar., 1848. A collection of his *Scritti Geografici* was made by Eugene Balbi (5 vols., Turin, 1841–42).

BALBI, GASPARO, a Venetian merchant of the 16th c., who is worthy of mention as the first traveler who has left an account of India beyond the Ganges. In the pursuit of his calling, B. was often led to Aleppo, and from thence, on one occasion, he made a visit to India, which lasted several years. After his return to Venice, he published, in 1590, the results of his travels in a volume entitled *Viaggio all' Indie Orientali*. A Latin translation was printed in De Bry's *Collection of Voyages and Travels to the East Indies* published at Frankfort in 1590–94. B. appears to have set down, without exaggeration, all that he himself saw, and is particularly minute and exact concerning commercial matters; but there is scarcely any limit to his credulity with regard to what he heard from others about the country. From Aleppo, his journey was down the Euphrates until opposite Bagdad; thence down the Tigris to Bassorah, where he embarked for the Malabar coast. Having visited Goa and Cochin, and other Portuguese settlements, he sailed for Pegu, then an independent empire, where he remained two years, returning by the same route. The most interesting part of his narrative is that relating to Pegu.

BALBI, GIOVANNI DE JANUA, or JANUENSIS, a Dominican friar of the 13th century. He wrote a cyclopædia which became one of the first of printed books, done at

Metz by Faust and Schaeffer, in 1460, and several times re-printed before 1520. Its full title is *Summa Grammaticalis Valde Notabilis quæ Catholicon Nominatur.*

BALBI'NUS, DECIMUS CÆLIUS, one of the two emperors of Rome whom the senate elected on hearing of the death of the elder Gordianus, and his son, in Africa, in opposition to Maximinus, who had the support of the legions in Germany. He was celebrated as an orator and a poet, and was a man of mild disposition. His coadjutor, Marcus Clodius Pupienus Maximus, was a bold and resolute soldier, who had risen from the people. They had only reigned a few months, during which time Maximinus had been killed by his own soldiers, who afterwards submitted to Maximus, when they were both killed in 242 A.D. by the pretorians, who at that time were animated by bitter hostility to the civilians, and extended it to the rulers who had been elected by them.

BALBO, CÆSARE, an Italian statesman and author, was b. 21st Nov., 1789, at Turin. When 18 years old, B. whose father had enjoyed the patronage of Napoleon, was appointed auditor of the council of state in Paris, and in 1812 he was made commissioner for the Illyrian provinces, ceded to France by the peace of Vienna. After the fall of Napoleon, B. went to London as secretary of the Sardinian embassy. After leaving political affairs, he devoted himself to the study of history, and among other works produced during the years 1821–43, were a *History of Italy*, which, however, extended only to the reign of Charlemagne; and a translation with commentary of Leo's *Development of the Constitution of the Lombardic Towns.* His *Speranze d'Italia* (Hopes of Italy), published in 1843, first extended his literary reputation to foreign countries. One of its main objects was to prove that national independence must precede the enjoyment of constitutional liberty; and that to strive after the latter, however good in itself, so long as the former had not been secured, was both foolish and reprehensible. It gave a vivid and intelligent picture of the political condition of Italy, its aims and prospects. His compendium of Italian history (*Della Storia d'Italia*, etc.) was also successful. B. took a prominent part as a moderate liberal in the political movements of 1847–48, and subsequently supported the ministry of Azeglio. He d. 3d June, 1853. He was a man of strict morality and unspotted character. In all his writings, B. adhered strongly to the Roman Catholic Church, whose truth he conceived to be the healing of nations as well as of individuals, and the only source of true culture.

BALBO'A, VASCO NUNEZ DE, a Spanish conqueror, was b. of a noble but reduced family at Xeres-de-Caballeros in 1475. After leading rather a dissolute life in his youth, he gladly took part in the great mercantile expedition of Rodrigo de Bastidas to the new world. He established himself in St. Domingo, and began to cultivate the soil; but fortune proving adverse, in order to escape from his creditors, he had himself smuggled on board a ship, and joined the expedition to Darien in 1510, commanded by Francisco de Enciso. It is curious to reflect that the man destined to discover the eastern shores of the largest ocean on the globe, should have been compelled to secret himself in a cask before he could share in the new enterprise. An insurrection which took place obtained for B. the supreme command in the new colony. Confused accounts which reached him of a great western ocean, impelled him, in 1513, to set out in quest of it. On the 25th of Sept. of this year, he obtained the first sight of the Pacific ocean from a mountain-top in the Isthmus of Panama. His natural enthusiasm at this great discovery was shared by all the educated men of his time, and the descriptions of it by contemporary authors may still be read with much interest. The governorship of the territories conquered by B. was obtained in 1514 by Pedrarias Davila, by means of his intrigues at the Spanish court. B. resigned the command into the hands of the new governor, a narrow-minded and cruel man, and, in a subordinate situation, undertook many successful expeditions; but these, and all his other merits, only served to increase the hatred of Pedrarias Davila towards him. The government of the mother-country sought in vain to mediate between them, and B. even married the daughter of Pedrarias. But on the first occasion of dispute which arose, B., having been induced by Pedrarias to deliver himself up, was accused of a design to rebel, and in violation of all forms of justice was beheaded at Santa Maria in 1517.

BALBRIG'GAN, a small maritime t. in Dublin co., 22 m. n. of Dublin. It is a seat of cotton, calico, and stocking manufactures. The cotton stockings made here are remarkable for fineness of texture and beauty of open work. Many females are employed in embroidering muslins. B. is a favorite watering-place. After the battle of the Boyne, William encamped here. Pop. '71, 2332.

BALBUE'NA, BERNARDO DE, 1568–1627; a Spanish poet and priest, educated in Mexico, and bishop of Porto Rico. His chief works are *The Age of Gold*, a pastoral romance; and *El Bernardo*, an epic poem.

BALBUS, LUCIUS CORNELIUS (MAJOR), b. Spain; made a Roman consul, and accompanied Cæsar to Spain, 61 B.C.; managed Cæsar's private property while the owner was in the campaign in Gaul. Octavius made him a consul, the first adopted citizen who held that office. He wrote a diary of his life, and by will left 20 denarii (nearly $3 present value) to every Roman citizen.

BALBUS, LUCIUS CORNELIUS (MINOR), nephew of B. major; appointed pontiff (a high priest of the pagan religion) by Cæsar. He was quester in Spain, but used his

office for fraud and oppression; fled to Africa, where he became pro-consul; gained a victory, and was honored with a triumph in Rome—the first bestowed on an adopted citizen.

BALCONY (Ital. Balcone), a projecting gallery in front of a window or of several windows, with a balustrade or parapet before it, and supported by consoles, or brackets fixed in the wall, or by pillars resting on the ground below. The B. was unknown in Greek and Roman architecture, and is probably an Italian contrivance, as the earliest examples of it occur in Italy, to the climate of which country it is peculiarly adapted. Balconies constructed of wood are of constant occurrence in the cottage architecture of Switzerland, to the picturesque character of which they add very essentially.

BALCONY, the gallery or stern-walk outside the stern of a large ship. Three-deckers have two such balconies, and two-deckers one. Where there are two, the lowermost is connected with the admiral's state-cabin, and the uppermost with the captain's cabin.

BAL'DACHIN (Ital. *baldachino*), signifies a kind of canopy, of the form of a tent or umbrella, made of costly materials and richly adorned, which is either supported on pillars, or fastened to the wall over a throne or couch, or over a pulpit, an altar, or other sacred object. One of the most celebrated is the B. in the church of St. Peter's in Rome, cast in bronze by Bernini, which is supported on four large twisted colums. B. was also the name formerly given to a kind of umbrella of a square form, made of silk brocade or other rich material, and supported on four poles, which was wont to be carried in the middle ages at solemn processions, coronations, marriages, etc., over the heads of royal personages or high dignitaries as a symbol of their rank. In Europe, the B. is now chiefly used in the processions of the Roman Catholic church. It is generally borne over the priest who carries the host. The word B., as well as the thing itself, comes from the east. Partly as a protection from the burning rays of the sun, partly as a symbol of their power and dignity, the rulers and great personages of the east seldom appeared in public, whether on foot or on horseback, in a litter or on an elephant, without a splendid canopy, often borne by the great men or chief officers of their kingdom. These canopies, generally made in the form of a tent or umbrella, were often sent, in the early part of the middle ages, as presents from eastern princes to those in the west; as, for example, from the caliph Harun-al-Raschid to Charlemagne. During the crusades, and the consequent trade with the east, they became well known to the Italians. Such canopies, as well as the rich stuffs of which they were made, were called, from the land whence they came, Babylonica; and also Baldachins, from Baldach, the eastern name of the city of Bagdad.

BAL'DE, JAKOB, a Latin poet, 1603–68, a native of Alsace. He was a Jesuit, and for a time court preacher and professor of rhetoric at Munich. He was especially successful as an imitator of Horace.

BALD (or WHITE-HEADED) EAGLE, *Haliaëtus leucocephalus*, so named because the white smooth feathers of the head make it appear as if naked; a native of North America, found near the sea-coast and in mountain chains; sometimes more than three feet long, with wings spreading seven or eight feet. The female lays two or more eggs in Jan., which are hatched the next month. She uses the same nest, usually in a high tree, year after year, and will stoutly defend her young. The B. E. is omnivorous, but especially fond of fish, which it catches, but oftener steals from smaller fishing birds. This is the bird that figures upon coins and flags as the emblem of the American union.

BALDER, or BALDUR, a divinity worshiped by the ancient Scandinavians, and probably also by the other Germanic nations, is the hero of one of the most beautiful and interesting of the myths of the Edda. B., who, according to old northern mythology, was the second son of Odin and Frigga, and the husband of Nanna (maiden), dreamed evil dreams which threatened his life. When he related them to the gods, they held a council and endeavored to secure his safety. Frigga took an oath from fire and water, from iron and all metals, from stones, earth, and plants, beasts and birds, the serpent, poison and all diseases, that they would not harm Balder. After this was done, the gods in their mirth sported with B., wrestled with him, and cast darts at him, but nothing could injure him. While the gods rejoiced at this, the thing displeased Loki (mischievous cunning or destructive fire). He changed himself into the form of an old woman, and inquiring the cause of the invulnerability of B., was told by Frigga that all things, animate and inanimate, had sworn not to harm him, with the exception of one little shrub, the mistletoe. Loki went in haste to fetch this shrub, and repaired with it to the assembly of the gods, where he placed it in the hands of the blind Höder, the god of war, directed his aim, and B. fell pierced to the heart. The sorrow of the gods was unutterable. Frigga asked who, to win her favor, would journey to Hel—the goddess of Hades or the grave—to release Balder. Hermoder or Helmod (the heroic), the son of Odin, readily offered his services, and Hel consented to grant his request on condition that all things should weep for Balder. All men, all living beings, and all things wept, save the witch or giantess Thöck (the step-daughter of Loki), who refused to sympathize in the general mourning. B. was therefore obliged to remain in the kingdom of Hel until the end of the world.

The myths of B. have been very differently interpreted. B., as the originator of all

that is beneficent and good—for B. and the other *sons* of Odin (see SCANDINAVIAN MYTHOLOGY) are only personified aspects or functions of the dimly-conceived one unseen Power that moves all nature—is represented as a hero of so lovely and graceful a manly beauty, that a brilliant light streams from his person; the whitest of the northern flowers is named *Balders-brow*. As the god of peace of the Germanic nations, who conducts to peace through battle and victory, he is a purely ethical conception, a mythical personification of the peace obtainable through conflict, and agreed to by compact among the gods. The gods, foreseeing doubtless that peace cannot long endure, seek in every possible way to secure the precious life of B., as even the weakest and most insignificant have it in their power to destroy peace. Loki, in his symbolical character as the god of retributive justice, stirs up Höder, or War, through whom the god of peace falls. Höder, indeed, is also slain by Wali, or Val-fader, the battle-god, and the war is ended by a bloody overthrow; but once violated and broken, peace is irrevocably lost along with Balder. Hermoder or Helmod labors in vain to restore it, for the giantess Thöck (retaliation, revenge) prevents it. Holy and true peace can only revive again in a new world, when the old sinful world and the old guilt-stained gods now ruling it shall have been destroyed.—Others (among them Max Müller) see in the myth of B. a representation of the contest between winter and summer. Compare Weinhold, *Die Sagen von Loki*, in Haupt's *Zeitschrift für Deutsches Alterthum* (Leip., 1849).

BALDI, BERNARDINO, 1533–1617; an Italian mathematician and author. He was master of more than a dozen languages, and wrote upwards of 100 different works. He was an abbot for 25 years, and on one occasion was envoy to Venice. B. had great reputation as theologian, mathematician, geographer, antiquarian, historian, and poet.

BALDNESS, *Alopecia*. See HAIR. There are some rare cases on record in which the hair has never been developed. This is termed *congenital baldness*.

Accidental baldness may involve the whole scalp, or may be only in patches; these patches may run into each other, and hence some consider this condition a species of ringworm. It is caused, says Mr. Erasmus Wilson, by an atrophy of the hair-follicles (q.v.). B. in the comparatively young and middle-aged may occur from wearing waterproof caps, which, by preventing evaporation from the head, occasion an unhealthy state of skin. Naval and military officers are liable to B. arising from this cause.

Senile baldness (calvities) is not necessarily the consequence of age; it may arise, like the preceding variety, from an atrophy of those parts on which the hairs depend for nutrition. It generally commences on the crown of the head, where the supply of blood is naturally less abundant. Women have a greater quantity of soft tissue under the skin, therefore the vessels are less likely to be interfered with; hence they are not so frequently bald as men.

The causes of B. are the defective supply of nutrition just mentioned, a family tendency, late hours, dissipation, but especially old age. The hair falls off after severe illness, or after other causes of general debility. During pregnancy the hair falls out; and in this country we often see the long hair of young women, victims to consumption, almost completely shed.

Treatment of baldness consists in attention to cleanliness, and in exciting the languid circulation of the scalp to greater activity, by using a hard hair-brush, and the application of stimulants, as the Spanish-fly ointment in the proportion of two drachms to an ounce of lard mixed with about the same quantity of pomatum. Or the stimulants may be applied in the form of lotions. But at the same time constitutional debility should be remedied by attention to the various functions of the body; tonics should be administered; and, if possible, causes of anxiety or night-watching should be avoided. Shaving the whole head is sometimes resorted to. If these remedies are successful, downy white hair, like that of an infant, begins to grow, which may or may not acquire the color and vigorous appearance of the former growth.

BALDO, MONTÉ, a mountain of Lombardy, on the e. of lake Garda, with an elevation of 7100 ft. It contains interesting petrifactions, and the fine green sand known as the sand of Verona.

BALDPATE, or AMERICAN WIDGEON, *Mareca Americana*, a duck much prized by epicures, found chiefly in the s.w. states, on the w. coast, and about the great lakes. It is named from its white-tipped head; and is marked with brown, chestnut, gray, or white.

BALDRICK, or BAUDRICK (Fr. *baudrier*), is a band or sash worn partly as a military and partly as a heraldic symbol. It passes round the waist as a girdle, or passes over the left shoulder, and is brought down obliquely under the right arm, or is suspended from the right shoulder in such a way as to sustain a sword. Many of the effigies of knights contain representations of the B., more frequently as a belt than a shoulder-sash. Queen Victoria frequently wears a blue silken B. on state occasions. The name is derived from the *balteus* of the Roman soldier.

BAL'DUNG, HANS, called also Hans Grün, a German painter and wood-engraver, a contemporary of Albert Durer, to whom, in expression, coloring, and finish, he was little inferior as a painter. He was b. in Gmünd, Swabia, about 1470, and d. at Strasburg in

1552. His masterpiece, a painting of the crucifixion, is in the cathedral of Freiburg; his wood-engravings are numerous.

BALDWIN, a co. in s. Alabama, on Perdido river, the gulf, and Mobile bay; intersected by the Mobile and Montgomery railroad; 1500 sq.m.; pop. '80, 8,446—3,702 colored. The surface is level and sandy, but supports a fine growth of pine timber. Co. seat, Blakely.

BALDWIN, a co. in central Georgia, on the Oconee river; 257 sq.m.; pop. '80, 12,998—9,140 colored. It produces corn, cotton, wheat, and sweet potatoes. Co. seat, Milledgeville.

BALDWIN, name of counts of Flanders, from the 9th to the 12th century. Baldwin I. was son-in-law of Charles the bald of France; Baldwin V. was son-in-law of Robert of France; Baldwin IX. became Baldwin I., emperor of Constantinople.

BALDWIN I., the first Latin emperor of Constantinople, was b. at Valenciennes in 1171 A.D., his parents being Baldwin, count of Hainault, and Margaret, countess of Flanders. In 1193, he succeeded to his mother's possessions, and in the year following, to the title and county of his father. In 1200, he appointed his brother Philip, along with other persons, to the regency of Hainault and Flanders, and joined the fourth crusade. Part of the crusaders—B. among others—were induced to assist the Venetians in reconquering Zara, in Dalmatia, from the king of Hungary. While at Zara, the young Alexis, son of Isaac II., emperor of Constantinople, craved the assistance of the crusaders against his uncle Alexis Angelus, who, having deposed and blinded Isaac II., had usurped the throne. In return for their aid, he promised them a liberal sum of money, and also to help them to recover Palestine. The crusaders agreed, and soon defeated the usurper's forces, and restored the rightful emperor; but Alexis having some difficulty in carrying out his promises, they turned their arms against him. A revolution breaking out in the city at the same time, Alexis the younger was murdered, and his father is said to have died of grief. Alexis Ducas Murzuphlus then usurped the throne, but was defeated by the crusaders, and the city was sacked—the crusaders and Venetians sharing the booty. B. was chosen emperor, and crowned on the 9th May, 1204; but he received only about a fourth part of the empire—Constantinople and Thrace—the Venetians obtaining the greater share of the provinces. A part also fell to the French adventurers who accompanied the expedition, and several provinces remained in the hands of Greek princes. The abilities of B.—and they appear to have been of a superior character—were not able to cope with the evils necessarily attending so anomalous a position. The Greeks were discontented, and, backed by Calo-Joannes, king of Bulgaria, while B.'s brother, with the flower of his troops, was away on an expedition in Asia, they rose and massacred the Latins scattered throughout the towns of Thrace, and made themselves masters of Adrianople. B. laid siege to the town with the forces he had at his disposal; but he was defeated and taken prisoner by the Bulgarian king, and died about a year after (1206) in captivity. He was succeeded by his brother Henry.

BALDWIN II., Emperor of Constantinople, was b. in 1217. He was the son of Peter de Courtenay and Yolanda, countess of Flanders, sister of Baldwin I. Being but 11 years old when, by the death of his brother Robert, he succeeded to the throne, he was placed under the guardianship of John of Brienne, titular king of Jerusalem, who died about 1237. B. then assumed the rod of empire, but he had neither the means nor the ability to wield it successfully against his powerful Greek and Bulgarian opponents. Two begging-visits to western Europe, in one of which he left his son Philip in pledge at Venice for a debt, and disposed of several most holy relics for money, were not successful in procuring him sufficient forces to resist his foes; and on the night of the 15th of July, 1261, his capital was taken by one of the generals of Michael Palæologus, ruler of Niceæa, and B. fled to Italy. With him terminated the Latin empire in the east, after it had lasted 57 years. His descendants for more than a century retained the title of emperor.

BALDWIN I., King of Jerusalem, 1100–1118, was b. in 1058. He was the youngest brother of Godfrey de Bouillon (q.v.), duke of lower Lorraine or Brabant. He took part in the first crusade; but having quarreled with Tancred, he retired to Edessa, at the request of the Christian inhabitants of the place, and was soon after elected to be count of Edessa. After the death of his brother Godfrey, in 1100, he became protector of the holy sepulchre, and baron of Jerusalem, and immediately assumed the regal title, which his brother had refused. He conquered Cæsarea, Ashdod, and Tripolis, and with the assistance of a Genoese fleet he became master also of Acre, and subsequently of Sidon, but failed to reduce Ascalon. He d. in 1118. Unlike his brother, who was a disinterested enthusiast, B. was worldly and ambitious.—BALDWIN II. (Baldwin du Bourg), cousin of Baldwin I., who had made him count of Edessa when he ascended the throne of Jerusalem, succeeded him, and reigned from 1118 to 1131. During his reign Tyre was taken, in 1124, with the assistance of a Venetian fleet; and the order of the Templars was instituted. Having been taken prisoner by the Turks, B. endured a captivity of six months. He d. on the 21st of Aug., 1131, leaving four daughters. Shortly before his death he resigned the crown in favor of his son-in-law, Foulques of Anjou, who reigned till 1134.—BALDWIN III., king of Jerusalem, 1143–1162, the son and

successor of Foulques of Anjou, was b. in 1129. He was a model of knighthood, which, during the period of the first crusades, was a personification of honor, justice, devotion, and love. Edessa was lost to the Christians during his reign. In 1152, he fought victoriously at Jerusalem against Noureddin, the sultan of Aleppo. In 1157, after he had defeated the same prince at Jacob's ford, on the Jordan, he again humbled him severely near Putaha. After this, he ruled in peace, and endeavored to improve both the external and internal defenses of his kingdom. The authority and influence of B. were so great, that even Saracens followed under him the banner of the cross. By his marriage with Theodora, the daughter of the Greek emperor Manuel, he gained a faithfully ally in that prince. He d., it is believed, of poison, in the flower of his age, at Tripolis, in Syria, on the 10th of Feb., 1162. With his death the Christian power in the east began to decline. He was succeeded in the government by his brother Amalric or Amaury, who d. in 1173.—BALDWIN IV., the son and successor of Amalric, surnamed the Leper, reigned till 1183.—When a child of 5 years old, BALDWIN V., the son of Sybilla, sister of Baldwin IV., was called to the throne. He d. in 1187, a year before Jerusalem was retaken by Saladin.

BALDWIN, JOHN DENISON, b. Conn., 1809; a journalist; educated by his own exertion, and licensed to preach in 1833. He wrote for magazines on archæology and kindred themes; became editor of the *Charter Oak*, a Hartford newspaper; afterwards of the Boston *Commonwealth*, and, still later, of the Worcester *Spy*. He has been three times chosen member of congress. In 1847, he published a volume of poems; in 1859, *Prehistoric Nations;* and in 1872, *Ancient America*.

BALDWIN, MATTHIAS W., 1796–1861; b. N. J.; a machinist; recorded as the builder of the first railway locomotive in this country; he subsequently built locomotives on an extensive scale in Philadelphia.

BALDWIN, THERON, D.D., 1801–70; b. Conn.; graduated at Yale; was home missionary of the Congregationalists in 1829; one of the founders of Illinois college; organizer of the Monticello female seminary, of which he was principal, 1838–43; and 27 years secretary of the society for promoting collegiate and theological education, in whose service his work was of great value. In his latter years he resided at Orange, N. J.

BALDWIN'S PHOSPHORUS is a term applied to the nitrate of lime, which, on evaporation, parts with its water of crystallization, and then, as discovered by Baldwin in 1675, assumes a luminous appearance in the dark.

BALE, JOHN, Bishop of Ossory, in Ireland, was b. at the village of Cove, in Suffolk, in Nov., 1495. He was educated as a Carmelite monk, but afterwards turned Protestant, and, being persecuted by the Roman Catholics, fled to Flanders, where he remained eight years, during which he wrote numerous works. He was recalled by Edward VI., and successively presented to the living of Bishopstoke, in Hampshire, and the bishopric of Ossory. In this latter sphere he made himself so obnoxious to the Catholics by his zeal in the Protestant cause, that on news of the death of Edward, his house was attacked, and five of his servants killed. He himself escaped out of the country after great difficulty, and the loss of all his effects. On the accession of Elizabeth he returned to England, and was made a prebend in the cathedral of Canterbury. He died in 1563. His fame mainly rests on a collection of British biography, which, notwithstanding that sections of a book are not unfrequently set down in it as distinct works, and that the names of persons who never wrote anything are set down as authors, is a valuable work. It was first published in 1548 under the title of *Illustrium Majoris Brittaniæ Scriptorum, hoc est, Angliæ, Cambriæ, et Scotiæ Summarium.*

BÂLE. See BASEL.

BALEARIC ISLES, a group of five islands—Mallorca (Majorca), Minorca, Iviza, Formentera, Cábrera—lying off the coast of Valencia, in lat. 38° 4′ to 40° 5′ N., and long. 1° to 5° E. They at one time formed the kingdom of Mallorca, which was united in 1289 with the crown of Aragon. They now form a Spanish province, and have unitedly an area of 1753 sq.m., with a pop., in '70, of 289,225. The soil generally is good. Vines, olives, and other fruit-trees are cultivated abundantly; but corn has to be imported. The coasts are precipitous, with some excellent harbors—Port Mahon, in Minorca, being one of the finest in Europe. The Phenicians visited the B. I. at a very early date, and they were followed by the Greeks, from one or other of whom they are said to have received their name. If from the Phœnicians, the name is derived from a Phenician word equivalent to the Greek *gymnetas*, signifying light-armed troops; if from the Greeks, then it is from *ballein*, to throw, and was given because of the expertness of the natives in using the sling, to the use of which they were trained from their infancy. Later, the B. I. became subject to Carthage; but after a short period of freedom, during which their inhabitants became pirates, were annexed to the Roman empire by Metellus (*Balearicus*), 123 B.C. From that time their history is involved in that of the peninsula. See SPAIN.

BALÉCHOU, JEAN JAQUES NICOLAS, 1715–65; a French engraver, whose best work is a full-length portrait of Augustus III. of Poland. He also made some fine plates after Claude, Vernet, and Vanloo.

BALE-FIRE. See BEACON.

BALEN, or BALLEN, HENDRIK VAN, 1560–1632; a painter of Antwerp, pupil of Adam von Oort, the teacher of Rubens. He finished his studies in Italy, and became instructor of Vandyke and Snyders. Some of his altar pieces are in the Antwerp cathedral.

BALESTRA, ANTONIO, an Italian painter, 1666–1740. He was one of the last great representatives of the Venetian school, and a member of the academy of St. Luke, in Rome, which gave him a prize for his "Defeat of the Giants."

BALFE, MICHAEL WILLIAM, an English composer of operas, etc., was b. May 15, 1808, in Dublin. His musical talent received early culture, and several anecdotes are related of his singular precocity. When only seven years old, he played publicly one of Viotti's concertos for the violin. At nine, he wrote the ballad entitled *The Lover's Mistake,* which achieved popularity through the singing of Madame Vestris. At sixteen, he made his début in London, at the Drury lane theater, as conductor of the orchestra. In 1825, he left this situation, in order to visit Italy, where he studied counterpoint under Frederici at Rome, and singing under Felippo Galli at Milan, and began his successful career as a composer, with music for the ballet *La Peyrouse* performed at the theater La Scala, in Milan. In 1827, he returned to the stage and sang in the Italian opera at Paris, where, in concert with Malibran and Sontag, he gained great applause, and many warm friends. He, however, returned to Italy, and devoted himself to composition, producing in rapid succession the operas—*I Rivali* (1829), *Un Avvertimento* (1830), *Enrico IV.* (1831), *Siege of Rochelle* (1836), *Maid of Artois* (1836), *Joan of Arc* (1837), *Falstaff* (1838), *Keolanthe* (1841), *The Bohemian Girl* (1843), *Les Quatre Fils Aymon* (1844), *The Bondman* (1846), *The Maid of Honor* (1847), *The Sicilian Bride* (1852), *The Rose of Castile* (1857), *Blanche de Nevers* (1860), *The Puritan's Daughter* (1861), *The Armorer of Nantes* (1863), and others. *Il Talismano* first saw the light in June, 1874, nearly four years after B.'s death, which happened on Oct. 20, 1870; and is perhaps his greatest work. Of the others named, *The Bohemian Girl* and *The Rose of Castile* have been most permanently successful. If B. was not a very original writer, he had a very thorough knowledge of effect and command of orchestral resources; and his compositions are distinguished by fluency, facility, and melodic power. See Kenney's *Memoir of Balfe* (1875).—His daughter, Mdlle. Victoria Balfe—who became duchess of Frias in Spain—was for some years a very acceptable public singer both in England and on the continent. She died in 1871.

BALFOUR, Sir JAMES, lord president of the court of session, and author of an able book, *Practicks of Scots Law,* was a son of Sir Michael Balfour of Pittendreich and Montquhany, in Fifeshire. In early life, he was implicated in the conspiracy against cardinal Beaton, and being in the castle of St. Andrews when it surrendered, in 1547, he was carried prisoner to France in the same vessel with John Knox. About two years after, returning to Scotland along with other of his fellow-prisoners, he changed his religion, his apostasy gaining for him the appellation of the "Blasphemous Balfour" from Knox, but unusual honors and emoluments from the queen and court. B. was sagacious enough to notice the increasing influence of Bothwell, and he immediately insinuated himself into his confidence, joined the conspiracy for the assassination of Darnley, and framed the bond for mutual support, signed by the conspirators. He was afterwards accused by lord Lennox as an accomplice in the murder of Darnley, but the trial was hurried over before proof of his guilt could be brought forward. In 1567, at the instance of Bothwell, he was appointed governor of Edinburgh castle; and he repaid the kindness of that nobleman and the queen, by handing over to the confederate lords the celebrated letters upon which they endeavored to found Mary's guilt, and which had been given him by Bothwell for safe custody. He afterwards surrendered the castle to Murray, on certain conditions, in which his own safety and interests were the chief considerations. The great object of B.'s life appears to have been self-aggrandizement, without regard to the means by which that was accomplished. Accordingly, we find him the recipient of favors under the regency, as he was under the queen. He was made a privy-councilor, commendator of the priory of Pittenweem; and in exchange for the clerk-registry, he received the lord presidentship of the court of session, and a pension of £500. When Morton was made regent, B. contrived to curry favor with him, and received from him a commission to make a general digest of the law. Not feeling himself safe in Scotland, however, he left it for France, where he remained for some time. When the young king ascended the throne, he joined the party hostile to Morton, but again fled to France, when in 1579 Morton recovered his authority. In 1580 he returned, and was instrumental in obtaining Morton's death, by producing the deed compassing the murder of Darnley, which that nobleman, along with others, had signed. He died in 1583.

BALFOUR, ROBERT, b. about 1550; a Scotchman, who was for many years principal of the Guienne college, at Bordeaux; author of a *Commentary on the Logic and Ethics of Aristotle.* B. was one of the scholars of the middle ages who helped to spread over Europe the literary fame of Scottish writers.

BALFOUR, WALTER, b. Scotland, 1776; d. Mass., 1852; educated in the Scottish church, but became a Baptist; and finally a Universalist, advocating with great ardor and success the doctrines of that sect.

BALFRUSH (or more correctly BARFURUSH, "mart of burdens"), an important commercial t. in the Persian province of Mazanderan, and situated on the river Bahbul, about 12 m. from its mouth in the Caspian sea. The river, which is here about 50 yards broad, but shallow, is crossed by a fine stone bridge of 8 arches. It is not navigated, all goods being landed at the port of Mesh-hedi-Ser, on the Caspian, from whence they are conveyed to B. by an excellent road. To the s. of the town there is an artificial island, about half a mile in circumference, on which the palace of Shah Abbas formerly stood. B. has excellent bazaars, and several Mohammedan colleges; the pop. is variously estimated at from 50,000 to 200,000. The latter estimate was made by Fraser, who visited it in 1822, since which time it has been greatly depopulated by plague and cholera. Flax and cotton are much cultivated in the vicinity.

BALGUY, JOHN, 1686–1748; an English theologian and philosopher, graduated at Cambridge, and ordained in 1710. B. was early in the warm religious controversies of the time, taking the side of Hadley against the high-church writers. In 1728, Hadley made him prebend of Salisbury, and the next year he became vicar of Northallerton. His chief works are, *Letters to a Deist, Foundation of Moral Goodness, Inquiry Concerning Virtue, Divine Rectitude, The Law of Truth,* and *Essay on Redemption.*

BA'LI, an island e. of Java; area, 2300 sq.m.; pop. 760,000. B. is volcanic—its highest mountain, 12,379 ft., having been an active volcano as late as 1843. Agriculture is the chief employment. The inhabitants grow rice, indigo, cotton, fruits, maize, and edible roots, and possess buffaloes and cattle. Fish is plentiful. Coffee culture is extending; and in 1873 its export from Bolêlêng, the trading capital, reached 21,040 cwts., valued at £58,333. B. is well situated for trade. The Balinese are a superior race, and speak a language related to Javan. They excel as sculptors, and in working gold, silver, and iron. Their legion is Brahmanism. Under the Dutch, the eight kingdoms are governed by native rulers. Chinese and a few Europeans are the chief traders.

BALIOL, EDWARD, son of John, makes himself momentarily conspicuous in history by his daring and successful invasion of Scotland, then under the regency of Randolph, earl of Moray, in 1332. Accompanied by some English noblemen bent on recovering their forfeited estates in Scotland, he landed with a few hundred followers at Kinghorn, in Fifeshire; defeated the earl of Fife; pushed boldly into the country; and on Dupplin moor, in Perthshire, routed with immense slaughter an army upwards of ten times more numerous than his own. On the 24th of Sept., seven weeks from the date of his landing, he was crowned king of Scotland at Scone. He had only enjoyed the kingly dignity for about three months, when he was surprised in his camp at Annan, and nearly lost his life as well as the crown he had so recently assumed. His subsequent career is the very reverse of what might have been anticipated from so adventurous a beginning, being marked only by weakness, servility, and misfortune. He died at Doncaster in 1363, and with him ended the house of Baliol.

BALIOL, JOHN, Lord of Galloway, and afterwards King of Scotland, was b. in 1259, and on the death of the princess Margaret in 1290, became a competitor for the crown of Scotland. As the grandson of the eldest daughter of David earl of Huntington, brother of William the lion, his claim was pronounced superior to that of the other principal competitor, Robert Bruce, lord of Annandale, son of the second daughter. The arbiter on the occasion was Edward I. of England, who found this a fit opportunity for asserting his claim as lord-paramount of Scotland. That claim was acknowledged by the Scottish estates in submitting the contest to his decision; and, consistently with this ignominious submission, B., before and after receiving the crown (Nov. 30, 1292), swore fealty to Edward as his feudal superior. He was soon made to feel that his sovereignty was merely nominal, and, abject as he had shown himself, the indignities which he experienced at length roused him to an assertion of his rights as king. In 1295 he took upon him, by the advice of his nobles, to conclude an alliance with France, then at war with England. This act of revolt was followed by speedy chastisement. Edward invaded Scotland with a large force; defeated the Scottish troops; took B. prisoner, and compelled him, after performing a humiliating penance, formally to surrender his crown, July 2d, 1296. B. was confined for three years in the Tower, enjoying, however, a limited freedom, and something of royal state. At the end of that time he was permitted to retire to his patrimonial estates in Normandy, where he died in 1314, a short time after the battle of Bannockburn. The estimate by his subjects of this unfortunate and poor-spirited prince was significantly indicated by the surname of "Toom Tabard," or Empty Jacket.

BALIOL COLLEGE. See BALLIOL COLLEGE, *ante.*

BALIS'TA, or BALLIS'TA (Gr. *ballein,* to throw), was one among the larger kinds of military weapons in use before the invention of gunpowder. The *B.*, the *catapulta,* the *scorpion,* and the *onager,* propelled large and heavy missiles, chiefly through the reaction of a tightly-twisted rope of hemp, flax, catgut, sinew, or hair; or else by a violent movement of levers. The scorpion was a kind of large crowbar; the B. threw stones; the catapulta threw heavy darts or arrows, and was somewhat smaller than the B. One man could manage the scorpion, but two or more were needed for the B. or the catapulta. There was a good deal of mechanism necessary to bring about the propulsive

force. The makers of those machines were very particular in the choice of women's hair, the sinews of a bull's neck, and the tendons of the deer, wherewith to fashion the elastic cord. The onager was a kind of B., which threw a stone by the agency of a sling instead of a stretched cord. The early chroniclers tell of catapultas that would throw an arrow half a mile, or hurl a javelin across the Danube; and of a B. which threw a stone weighing 360 lbs. Numerous other weapons of an analogous character were known in the middle ages—such as the *mangonel;* the *trebuchet*, which threw a large stone by the action of a lever and a sling; the *petrary*, which, as its name implies, threw a stone; the *robinet*, which threw darts as well as stones; the *mate-griffon* and *mate-funda*, both slinging-machines; the *tricolle*, which hurled quarrels, or square-headed arrows; the *espringal* or *springal*, which threw large darts; the *ribaudequin*, a large kind of cross-bow; the *war-wolf*, a stone-throwing machine, etc. The arbalest (q.v.) may be regarded as a small portable arrow-throwing Balista.

BALIS'TÉS, or FILE-FISH, a genus of osseous fishes of the order *plectognathi* (q.v.) of Cuvier; the type of a family, *balistidæ*, the species of which are almost all inhabitants of tropical and subtropical seas, frequenting rocky coasts and coral-reefs. Their colors are generally brilliant. The body is remarkably compressed. The ossification of the skeleton, as in the other plectognathi, is very incomplete, and the external covering of the body resembles that of the ganoid (q.v.) fishes, consisting, in some of the genera, of large rhomboidal scales, disposed in regular rows, and not overlapping; in others, of very small rough scales, with stiff bristles, as densely crowded as the pile of velvet. But the most interesting thing in connection with these fishes is the provision for fixing the first dorsal spine in an erect position, or lowering it at the will of the animal. The spine is articulated "by ring and bolt to the broad interneural osseous plate." "When the spine is raised, a depression of the back part of its base receives a corresponding projection from the contiguous base of the second ray, which fixes it like the hammer of a gun-lock at full cock, and it cannot be let down until the small spine has been depressed, as by pulling the trigger; it is then received into a groove on the supporting-plate, and offers no impediment to the progress of the fish through the water. This trigger-like fixing of the spine takes place also in the dead fish; and when a B. is removed from the bottle for examination, it is generally necessary to release the spine by pressing on the small trigger-ray." The spine is roughened with enamel grains, whence the name file-fish. The flesh of these fishes is generally regarded as unwholesome.

BALISTRA'RIA (Ital. *Balestriera*), one of the names given to those narrow apertures so often seen in the walls of old castles, and through which the cross-bowmen discharged their arrows. See BALISTA. B. do not seem to have come into use till the 13th century. The lower terminations of B. are generally circular, sometimes in the form of a shovel. See LOOPHOLES.

BALIZE, BELIZE, or BRITISH HONDURAS, a British colony on the bay of Honduras, in the Caribbean sea, extending in n. lat. from 16° 45′ to 18° 30′, and in w. long. from 88° 10′ to 89°. It forms the s.e. part of the peninsula of Yucatan, which here divides the Caribbean sea from the gulf of Mexico. Its area is 13,500 sq. miles. In 1870, the pop. was 24,710—377 white, and 24,333 colored; nearly half of the whole being in the town of B., which stands at the mouth of a river also of the same name. The Balize traverses the middle of the country for about 200 m., and the Rio Hondo and Siboon form respectively its n.w. and s.e. boundaries. The early British settlers were frequently attacked by the Spaniards; but since 1798, when they repulsed a fleet and land-force of 2000 men, their occupation has been formally acquiesced in. Since 1862, B. has ranked as a British colony, and has had a governor and local magistrates. The country has a general tropical fertility, but its chief exports are mahogany, sugar, coffee, cotton, India-rubber, and logwood with other dye-stuffs. B., the capital, is a depot for British goods for Central America, and has a varying pop. of 8000 to 15,000.

BALIZE (from *balise*, "a beacon"), a village near the mouth of the Mississippi, inhabited chiefly by pilots. Reporting a vessel "at the Balize" means that she is at, or has passed, the mouth of the river.

BALKAN', or HÆMUS, the eastern branch of that mountain-system which comprehends the ranges of Montenegro, Herzegovina, and the Dinaric Alps. It extends from the plain of Sophia to cape Eminch, on the Black sea, and forms the southern boundary of the basin of the Danube, and dividing the principality of Bulgaria from Eastern Roumelia. Its highest summit, Tchat-al-dagh, is 8340 ft. above sea-level; but the general height of the range is about 4000 feet. Toward the Black sea, the mountains become lower, and diversified with wooded slopes. They send several offshoots n. and s., and are of great strategical importance in the defense by Roumelia. The chief route across them is that of Trajan's Gate, which connects Constantinople with the w. of Europe. The attempt by the Turks to regain possession of the Shipka pass was one of the fiercest contests of the war of 1877.

BALKASH', or TENGIZ' (Tenghíz or Tenguíz), a lake near the eastern borders of Russian Central Asia, lat. 45° and 47° n., long. 75° and 79° e. Its length is stated at about 300 m., and its greatest breadth 75 miles. Its principal feeder is the river Ili. It has no outlet.

BALKH, a district of Afghan Turkestan, the most northerly province of Afghanistan. It was for some time subject to the Khan of Bokhara. It corresponds to ancient Bactria, and lies between lat. 35° and 37° n., and long. 64° and 69° e. It is bounded on the n. by the river Oxus, on the e. by Budukshan, on the s. by the Hindu-Kush, and on the w. by the desert. Offsets of the Hindu-Kush traverse it in a n.w. direction, and slope down to the low steppes of Bokhara. Its length is 250 m.; its breadth, 120. Its situation was once important during the overland commerce between India and eastern Europe before the sea-route by the cape of Good Hope was followed. The soil has the general characteristics of a desert land; only a few parts are made fertile by artificial irrigation; and such are the vicissitudes of climate, that where grapes and apricots ripen in summer, and the mulberry-tree permits the cultivation of silk, in winter the frost is intense, and the snow lies deep on the ground. The natives are Usbek Tartars; and their character seems to depend very much on that of the country. In the barren regions, they are simply plunderers of caravans; in the more favorable ones, they are peaceful nomads; and in the most prosperous districts they are tillers of the soil, and artisans in towns and villages. Pop. estimated at about 1,000,000.

BALKH, the chief t., 23 m. from the Amu, is situated where the Rudi Haaj is distributed in numerous canals. It is surrounded by a mud wall; but though bearing the imposing title of Amu al Bulud (Mother of Cities), it has little of the grandeur of ancient Bactra, on the site of which it is built. It was twice destroyed by Genghis Khan and Timur; and as late as 1825, it was plundered by the powerful ruler of Kunduz, Mir-Murad-Bei. The neighborhood is famous for its corn and fruits. As a boundary town between Afghanistan and Bokhara, B. assumed a prominent position in the British-Afghan war. Pop., 2000.

BALL. Games with balls were among the most favorite gymnastic exercises of the ancients. They were played almost daily by all, young and old; by the highest statesman equally with the lowest of the people. The Greeks prized the game as a means of giving grace and elasticity to the figure, and erected a statue to one Aristonicus for his skill in it. The effeminate Mæcenas amused himself during a journey by playing B., as we learn from Horace. In the gymnasia of the Greek, and in the Roman baths there was a special compartment for Ball-playing (*sphæristerium*), where certain rules and gradations of the exercise were to be observed according to the state of health of the player. The balls were of very various kinds; they were generally of leather, and filled with air; others were stuffed with feathers. Ornamented balls, composed of 12 differently colored segments (such probably as are to be seen in modern toy shops), are mentioned in Plato's *Phædon*. There was also great variety in the kinds of game, each having a name. In one, the B. was thrown up, and the players strove who would catch it as it fell; another was the same as our foot-ball; in a third, a number of persons threw it at one another, either with a view to hit, or for the B. to be caught and returned; in a fourth, the B. was kept rebounding between the earth and the palm of the player's hand as often as possible.

Ball-playing seems to have been of equal antiquity in the west of Europe, and to have come down uninterruptedly to modern times. In the 16th c., it was in great favor in the courts of princes, especially in Italy and France. The French *jeu de paume* and the English *tennis* (q.v.), are often mentioned. Houses were built for playing in all weathers; and in gardens and elsewhere long alleys were laid out for the purpose, the names of which still adhere to many localities. The B. was struck with a mallet—It. *maglia*, Fr. *mail* or *maille*, Eng. *mall*. The mallet was also called by the compound name *pall-mall*, *pell-mell*, or *pall-mall*, from It. *palla* (Lat. *pila*), a ball. The same names signified also the game or the alley where it was played; hence the English malls and pall-malls. The game is thus described in *Blount's Glossographia*, quoted in Cunningham's *Hand Book of London:*

"Pale maille (Fr.), a game wherein a round bowl is with a mallet struck through a high arch of iron (standing at either end of an alley), which he that can do at the fewest blows, or at the number agreed on, wins. This game was heretofore used in the long alley, near St. James', and vulgarly called pell-mell."

Towards the end of the 18th c., the game of B. ceased to be played at courts, and at the same time went out of fashion in the higher circles of continental society, though it is still practised by the people in Spain and Italy. The forms of it called *cricket* (q.v.), *golf* (q.v.), *foot-ball* (q.v.), *fives* (q.v.), *lawn tennis*, *polo*, etc., are more or less practised throughout Great Britain.

For cultivating graceful motion, agility, and strength, as well as promoting general health of body and cheerfulness of mind, Ball-playing is one of the best gymnastic exercises. Ancient physicians were in the habit of prescribing a course of balls to their patients where most modern doctors would likely prescribe *pills;* and in this point at least the ancient practice might be copied with advantage.

BALL. In the somewhat indefinite language of the military and naval arts, all kinds of shot and bullets are occasionally called by the collective name of *ball*. This was especially the case when nearly all such projectiles were solid and spherical, before the era of hollow and spheroidal shells. At present, when the varieties are so numerous, it is more usual to employ the terms BULLET and SHOT (q.v.). These, together with

SHELL, are subdivided into numerous kinds, the most important of which will be found noticed under their proper designations. A particular class of spherical combustibles is described under BALLS. For BALL-CARTRIDGE, see CARTRIDGE.

BALL (Fr. *bal*), a dancing entertainment. In England there are co. balls, attended by the gentry of the shire or co. military balls, court balls, subscription balls, besides balls on various festive occasions. Whether designated balls or assemblies, these entertainments are conducted with great decorum, according to certain established usages. If of a general kind, it is expected that those who avail themselves of tickets shall be of undoubted respectability; and, as a further voucher of propriety, a number of lady-patronesses (married ladies of distinction) take a lead in the management, and grace the assembly by their presence. Ordinarily, the charge for gentlemen's tickets at subscription balls is at least two-thirds higher than those for ladies. According to etiquette, no unmarried lady can attend a ball unless she accompany a gentleman, or a married lady. All, of both sexes, are expected to be in full dress—anything else would be held disrespectful. Fancy balls are entertainments at which every person attending is expected to be in a fancy or peculiar national costume; in other respects, they are conducted like ordinary balls. Masked balls, once so common, have now, for obvious reasons, lost their repute. At all high-class balls, there is an appointed master of the ceremonies, or "director," who superintends the proceedings, and, in the event of there being no programme, prescribes the dances.

BALL, GAME OF. See BASE BALL.

BALL, THOMAS, b. Mass., 1819. A sculptor. Among his works are statues and busts of Washington, Webster, Everett, Choate, etc.

BALLACHU'LISH, a *quoad sacra* parish, partly in Argyle, and partly in Inverness shires. In the Argyleshire part of the parish, 11½ m. s.s.w. of Fort William, on the s. side of Loch Leven, an e. branch of Loch Linnhe, are the celebrated quarries of blue roofing clay-slate. These quarries, which have been wrought for some time previous to 1760, employ from 200 to 300 men. White and gray marble quarries exists also in the neighborhood.

The slate is exposed on the mountain-side, and the quarries, commencing on the shore, extend southwards along the side of the mountain. The face of the rock is laid open by three workings fronting the w., and rising one above another in successive step-like terraces, all of them being entered from the n. end of the bed. The height from the lowest terrace to the top of the workings is about 216 ft., and the face of rock wrought about 536 feet. The situation of the quarries permits the water and débris of broken and waste slate, which amounts to about six times the quantity of salable materials raised, to be at once got rid of into the sea. A few years ago, the annual produce amounted to from 5,000,000 to 7,000,000 of roofing-slates, weighing about 10,000 tons. The village of B. contained in 1871, 944 inhabitants.

BALLAD. The name is of Italian origin (*ballate*), and meant originally a dance-song, being derived from the mid. Lat. *ballare* or *balare*, corresponding to the Gr. *ballizein*, to dance. The B. is a kind of poem which it is very difficult to characterize. In the course of centuries it has undergone various transformations, and the name has been transferred to pieces which in extent, subject, and character have no longer anything in common with the primitive ballad. The confusion of ideas was rendered still worse from the circumstance that poems of exactly the same nature were styled sometimes romances, sometimes ballads, sometimes epic or lyrico-epic, or poetic narratives; so that it was left to the caprice of the poet which of these generic names he would give to his production. As early as the 12th c. the Italians gave the title of B. to short, purely lyrical pieces, allied to the sonnet or still more to the madrigal, and which generally had love-sorrows for their subject. Dante has such *ballate*. Akin to these are those French ballads which Molière set himself against, and which fell into disuse. The earliest ballads, as the word is now understood, are those of England and of Scotland, beginning about the 14th century. They in so far resemble the Spanish romances, that the subject in both is narrative, and handled lyrically. See LYRIC. The Spanish romance, however, has more of the lyrical element, and is of a gayer cast, reflecting the southern character of the people; while the northern B. took a more earnest, somber shape, especially among the Danes; though in the n. also there are ballads of a cheerful and sportive tone.

As far as subject is concerned, the B. is a species of minor epic (q.v.). The name is generally applied to a versified narrative, in a simple, popular, and often rude style, of some valorous exploit, or some tragic or touching story. Ballads are adapted to be sung or accompanied by an instrument. They are comparatively short, the story being circumscribed, and not embracing a combination of events, as the plan of the grand epic does. There can be little doubt that the B. has been the first form of poetry among all nations; and that the earlier epics or heroic poems of the higher kind, such as the Spanish Cid or the German Nibelungen, grew out of such simple beginnings. Of the popular B., Scotland, or more correctly the border-land of Scotland and England, is allowed to have produced the best examples—as *Chevy Chase*, *Fair Helen of Kirkconnel*

Lee, and many others. As a B. of modern composition may be instanced Goldsmith's *Edwin and Angelina*.

Many of the old popular songs of the Germanic nations are just narratives of epic events and incidents in which the feelings of the composer manifest themselves. But the name of B. was not then in use, and such poetical narratives were called simply songs, or more specifically perhaps *lays* (Ger. *leich*). It was not till the last half of the 18th c. that the foreign name was transferred to them.

The B. has, in recent times, been cultivated chiefly by the Germans, and in their hands it has assumed a more artificial development. Bürger may be said to be the creator of the modern ballad. He was intimately acquainted with the more simple Scotch and English B. poetry; but while adhering to its spirit, he gave to his own compositions a far wider extent, surrounded his narration with descriptions of scenery and other decorations, and by means of dialogue imparted to them the vivacity of the drama. His *Leonore* has become at once classical and popular. Bürger, Schiller, Göthe, and Uhland are the greatest German names in this department of composition. Following the practice of these writers, it has become common to confine the name B. to an epic narrative with something fabulous and supernatural in the background. In this sense, Göthe's *Erlkönig* is a ballad; and Coleridge's *Ancient Mariner* is perhaps the best exemplification in English.

BALLANCHE, Pierre Simon, 1776–1847; a French theocratic philosopher, author of *Du sentiment considére dans la litérature et dans les Arts*, *Antigone* (a prose poem), *Essai sur les Institutions Sociales dans leur Rapport avec les Idées nouvelles*, *Le Vieillard et le Jeune Homme*, *L'Homme sans Nom* (a novel), *Palingénésie Sociale*, *Vision d'Hébal*, etc. The *Palingénésie*, which he did not finish, was to be an exposition of the workings of God in history, and is considered his greatest work. B. became a member of the academy, and is represented as a warm-hearted, amiable man, whose intellect was overshadowed by his imagination.

BALLARAT, the oldest of the *considerable* gold-fields of Victoria, and in fact the oldest but one of all the gold-fields of the colony. It is about 65 m. w. by n. of Melbourne. It was first worked in Sept., 1851, the comparatively unimportant ground at Anderson's creek, which dated from Aug. of the same year, having been the earliest result of the "prospecting" which, a few months previously, had been stimulated by the newly discovered "diggings" of New South Wales. Though B. was speedily rivaled by Mount Alexander and Bendigo, yet it has by no means lost its original pre-eminence. As its surface-digging became exhausted, mines were formed—some of them now as deep as average English coal-pits. In 1876 there were in B. (also spelt *Ballaarat*) 142 steam-engines, of 4662 horse-power, working the alluvial mines, and 159, of 3866 horse-power, used in quartz mining. *B. West* was raised to the dignity of a city in 1870, and has a pop. of nearly 50,000. It is connected by railway with Melbourne.

BALLARD, a co. in w. Kentucky, on the Mississippi and Ohio rivers; 500 sq.m.; pop.'80, 14,378—1,725 colored. Productions—tobacco, wheat, corn, and oats. Co. seat, Blandville.

BALLAST is a heavy substance employed to give a ship sufficient hold of the water, to insure her safe sailing with spread canvas, when her cargo and equipment are too light. The amount of B. required by a ship depends not only on her size and cargo, but also on her build; some forms of construction requiring more B. than others. It is not merely the *quantity* of B. which a skillful mariner has to consider; he is required also to take into account its *distribution*. If a heavy mass of B. be deposited within a small compass near the keel, it places the center of gravity very low down; the ship will sail sluggishly, and is said to be "stiff." If, on the other hand, the B. be massed too high up, the ship becomes "crank," and cannot carry much sail without danger of being upset. Under average circumstances it is considered that a ship is well ballasted when the water comes up to about the extreme breadth amid-ships.

In ballasting a ship, the cargo and B. are considered together, the quantity and distribution of the latter being made dependent on the former. In a ship of war, the B. is made subservient to the requirements of the necessary stores and war *materiel;* in a merchant or passenger vessel, to the convenience of the passengers and the careful stowage of the cargo. During the last great European war, the ships of the British navy were supplied with a certain conventional weight of B., according to size and armament. Thus, a 100-gun ship had 550 tons of B.; an 80-gun, 440 tons; a 50-gun, 235 tons; a 36-gun, 225 tons; a 20-gun, 110 tons, etc. The recent revolution in the sizes and shape of war-ships, however, and the introduction of steam-propulsion, have rendered all such fixity of ratio inapplicable.

The substances used as B. are various—chiefly iron, stone, gravel, sand, mud, and water. Iron is now superseding the next three varieties in ships of any importance; and water-ballast is gradually being introduced in the collier-ships of the Tyne, Wear, and Tees. Water-ballast is employed in four different ways. *Bag-water* B. is contained in water-proof bags laid on the floor of the vessel, and filled or emptied by means of a pump and a hose. *Bottom-water* B. is confined beneath a false bottom in the vessel. *Hold-water* B., first employed in screw-steamer colliers constructed by Mr. Scott Russell, is contained in a large receptacle, which may be filled with the cargo when the ship is not in B.

Tank-water B. is contained in two fore-and-aft tanks, which can easily be filled and emptied. The customs' laws relieve merchant-ships from certain formalities and payments when leaving a port in ballast.

The term B. is employed by civil engineers to signify the sand or gravelly material which is laid as a packing between railway-sleepers, in order to give them solidity. No English railway is considered to be complete or safe for transit until it is dressed and finished by ballasting. The possibility of procuring B. at a cheap rate, considerably affects the cost of railway undertakings.

BALLAST HEAVING has reference to the use of sand or mud ballast. In order to prevent captains from filling up, or otherwise injuring the entrance to rivers, ports, havens, roadsteads, etc., by the discharge of ballast, certain regulations have been made at most maritime places as to its disposal. The Trinity House corporation has a peculiar jurisdiction over the bed of the Thames, and regulates all the proceedings touching the reception and discharge of ballast. Before the use of water-ballast, the collier captains ballasted their empty ships with gravel or sand, mostly dredged up from the bed of the Thames in and near Woolwich Reach. Generally about 10,000 tons per annum were thus used. The ballast-heavers were men employed by the Trinity House ballast-office in transferring sand from the bed of the Thames to the empty ships. When the collier vessels returned to the Tyne or its neighborhood, they were not permitted to empty the sand in the river, but were under penalties to discharge it on shore. This is the origin of the vast mounds or sand-hills on the banks of the Tyne, which have been made very useful in the construction of railways. Ships coming into, as well as those leaving the Thames in ballast are equally subject to Trinity House control. The ballast-office corporation of Dublin has similar powers in reference to the river Liffey.

BALLATER, a village of Aberdeenshire, Scotland, on the banks of the Dee, 36 m. w.s.w. of Aberdeen. It is remarkable as the resort of numerous visitors, on account of its chalybeate springs. Pop. '71, 691.

BAL'LENY ISLANDS, a group of 5 small volcanic islands discovered in the Antarctic ocean, 1839. Lat 66° 44′ s., long. 163° 11′ east.

BALLET (of similar derivation with the word *ball*—see BALLAD), a species of dance usually forming an interlude in theatrical performances, but confined principally to operas. Properly, a B. is a theatrical exhibition of the art of dancing in its highest perfection, and must therefore, in general, comply with the rules of the drama as to its composition and form. The pantomimic sacrificial dances of antiquity, although they may be regarded as the source of Attic tragedy, are not to be considered as directly the origin of the ballet. The B., as known to us, undoubtedly originated in the service of the courts. We find it existing in Italy in the beginning of the 16th c., especially at the court of Turin, where it was enriched by the inventive genius of count Aglio; and where the princes and princesses of the court themselves took part in it, in song and declamation as well as in dance; for the B. at first appeared in combination with the other theatrical arts, and completed the chaotic medley exhibited in these spectacles, which were at once mythological, allegorical, fantastic, warlike, and pastoral. From these mingled elements the individual species of dramatic entertainments were gradually evolved in their distinct forms. Baltagerini, director of music to Catharine de' Medici, was the first to introduce the B. into France, where it soon became such a favorite, that Louis XIII. danced in one of these ballets, and his example was followed by Louis XIV. in his youth. The latter made his last appearance on the stage in 1699, in the B. of *Flora*. Hitherto. the B. had always appeared in combination with the characteristic features of the opera, and even of comedy, as is evident from the works of Quinault and Molière, arranged by Lully. The art of dancing possessed then little dramatic expression, and still required to be introduced and explained by singing and recitation. In 1697, Antoine Houbart de la Motte undertook to reform the B., to which he imparted both dramatic action and the expression of passionate feeling. About this time, women first made their appearance in the B., as well as in plays and operas, which had till then been performed exclusively by men. There is no mention of any female B.-dancer of note before 1790. About the middle of the 18th c., Noverre separated the B. from the opera, gave it an independent dramatic form, and laid the foundation in his writings of an ingenious theory on the subject. The mythological B., a relic of the magnificence of Versailles, came to an end during the consulate, when it gave place to the newly invented comic ballets *Dansomanie*, *La Fille mal Gardée*, and the *Arlequinades*. Vincenzo Galeotti, in Copenhagen, carried out the ideas of Noverre so far as to subordinate the dance to purely dramatic principles, instead of giving it the first place as formerly; and thus he gave to his ballets the character of great rhythmical pantomimes. These splendid and talented performances were longest kept up in the theater of Milan, where the most lifelike and magnificent tableaux were exhibited in pantomime; and subjects were attempted far beyond the limits of the ballet. The story of *Hamlet* was turned into a B., and the subjects of several other tragedies were similarly treated. In general, the B. has now become unfaithful to its original design and its true artistic signification; and exhausts itself in the exhibition of mere feats of bodily agility, tasteless displays of artificial dexterity, distortions of the person almost to dislocation, and balancings of the figure in attitudes often indelicate. Consisting as it does more of external show than internal meaning, it contributes gradu-

ally to blunt the public taste for the enjoyment of the legitimate drama, which speaks more to the mind than to the eye.

BALL-FLOWER, so named from its resembling a ball placed in a circular flower; an ornament peculiar to the decorated style of Gothic architecture which prevailed in the 14th century. The B.-F. is supposed by some to be an imitation of a pomegranate, by others of a hawk's bell.

BALLINA', a seaport t. on the confines of Mayo and Sligo counties, Ireland, but chiefly in Sligo, on the Moy, 7 m. s. of its entrance into Killala bay. The Moy runs through the town, is crossed by two bridges, and separates the two counties. B. proper is on the Mayo side, the Sligo portion being a suburb called Ardnaree. The tide runs up to the town, but the river is only navigable from the sea up to a mile and a half below B. B. has a brisk trade in agricultural produce, salmon, and cured provisions. Coarse linens and snuff are manufactured here. Many anglers resort to the river Moy and lough Conn. Killala bay was the rendezvous of the French invaders in 1798. They landed and took B., but were, three weeks afterwards, defeated at Killala. Pop. '71, 5843.

BALLINASLOE', a small inland t. on the borders of Galway and Roscommon counties, near the center of Ireland, on both sides of the river Suck—which divides the two counties—8 m. from its confluence with the Shannon, and 81 m. w. of Dublin. The Suck at B. is divided into several channels, over which the road from Athlone to Galway is carried by a succession of bridges and causeways 500 yards long. B. is noted for its great annual fair in Oct., one of the largest in the kingdom. It is the seat of a poor-law union, and the station of the Galway militia staff. Pop. '71, 5053.

BALLINROBE', a small t. of Ireland, co. Mayo, picturesquely seated on the Robe, about 3 m. from its mouth in lough Mask, and about 16 m. s.s.e. of Castle Bar. B. is a seat of petty and general sessions, and has a union workhouse and a barrack. It has a weekly market and two annual fairs. Pop. '71, 2408.

BALLI'OL COLLEGE, Oxford, was founded between 1263 and 1268 by John de Balliol, father of John Balliol, king of Scotland. The original foundation consisted of 16 poor scholars, and the revenue for their maintenance amounted for many years to only 8*d.* per week for each. In 1340, the establishment was enriched by benefactions from Sir William Fenton and sir Philip Somervyle, the latter of whom gave the college a new body of statutes. Its most important subsequent benefactors were Bell, bishop of Worcester, in 1566; William Hammond, Esq., in 1575; Peter Blundell's executors in 1615 and 1676; Lady Periam, 1620; Warner, bishop of Rochester, 1667; John Snell, esq., 1677; and Mrs. Williams, 1830. The society consists of a master, 13 fellows, and 24 scholars. The number of members on the books in 1877 was 600. The master and fellows enjoy the privilege of electing their own visitor. John Wycliffe was master of this college in 1361; among its scholars have been John Evelyn, and Bradley the astronomer. The Snell exhibitions for students of Glasgow university attract annually to this college a few distinguished Scottish students. Among these have been sir William Hamilton, J. G. Lockhart, and Dr. Tait, archbishop of Canterbury.

BALLIS'TA. See BALISTA.

BALLIS'TIC PEN'DULUM. An instrument so named was invented by Robins, in the latter part of last century, to ascertain the velocity of projectiles, and to prove the quality of gunpowder. It consists of a large block of wood suspended from a strong horizontal axis; and it is so solidly constructed as to bear the heaviest blow of the heaviest shot without injury. An excavated center on one side of the block is filled with sand, packed in leather upon an iron frame; four bags form a filling or core. The core, forming the place of impact, is easily replaced after each firing. Straps of wrought iron suspend the block from the wrought-iron axis or shaft. The shaft-ends have knife-edges, which rest on V. supports. The construction is such, that a violent percussion makes only a very slight oscillatory movement in the block. A brass graduated limb measures the arc of vibration; and a brass slide is pushed forward by an index attached to a bar connected with the suspension straps. Another form of instrument for similar purposes is described under EPROUVETTE; and some of the results of these experiments are noticed under GUNNERY. See WAR-SERVICES.

BAL'LIUM. See BAILEY.

BALLOON (Fr. *ballon*, a large ball). According to the principle of Archimedes (q.v.), bodies immersed in a fluid are buoyed upwards with a force equivalent to the weight of the fluid displaced by them. If their own weight is not sufficient to counterbalance this force—that is, if they are lighter than the fluid—they rise upwards with a force equal to the difference of the weight of the displaced fluid and of their own weight. A B., therefore, which consists of an integument inclosing a gas within it, will rise in air in the same way that a cork rises in water, provided that the weight of the whole be less than that of an equal volume of air. If one, for instance, occupy as much space as 1000 lbs. of air, but weigh itself—covering, gas, and appendages—600 lbs., it will be impelled upwards with a force of 400 lbs. The gases employed for filling balloons are either hydrogen or ordinary coal-gas. The former, when pure, is between 14 and 15 times lighter than atmospheric air, and the latter generally about two and a half.

The B., as it is at present employed, is a large pear-shaped bag, made of any pliable silk cloth, covered with a varnish, made by dissolving caoutchouc in oil of turpentine, to render it air-tight. The common size of this bag varies from 20 to 30 ft. in equatorial diameter with a proportionate height. The mouth or neck of this bag is just large enough to enable a man to get inside to make any necessary repairs, and is, of course, turned downwards when the B. is inflated. A net-work of hempen or cotton twine is accurately fitted to the B., and the separate cords, on which it ends, are tied to a circular hoop placed a few feet below the neck. The car, generally a large wicker-basket, is suspended by ropes from this hoop, and hangs at a considerable distance below, so that the aëronaut may be removed from the vicinity of the gas. The net-work serves to distribute the weight of the car and its charge equally over the whole upper surface of the balloon. One of the most important requisites in the construction is the valve, which is introduced into the top of the balloon. It consists of a wooden clapper, 4 or 5 in. square, opening inwards, and kept closed by a sufficient spring. A rope attached to this valve descends through the neck into the car, where, to prevent accidental opening, it is allowed to dangle freely. The furniture of the car are the ballast or sand-bags, by emptying which the B. may be lightened; the barometer, or corresponding apparatus for telling the height ascended, or the upward or downward course of the B.; the map and compass, for showing the direction of the voyage; and the grappling-iron, tied to the end of a long rope, for anchoring the B. at the descent. During his flight, the aëronaut has at his disposal the means of guiding his air-ship only in an upward or downward direction, the motion of translation being wholly dependent on the wind by which it is borne. If he wishes to ascend, he throws some of the ballast over the side of the car; and if to descend, he pulls the valve-rope, so that, the gas rushing by virtue of its specific lightness through the passage made for it by the open valve, the buoyant material may be lessened. It is evident that the power of thus directing his machine becomes more limited with each exercise of it, for in each case there is an unrepaired loss of the means necessary to it. All attempts at guiding balloons in a horizontal direction have hitherto proved failures. In ordinary flights, the mouth of the B. is left open, so that there is no danger of explosion arising from the expansion of the gas in the rarer regions of the atmosphere. The diffusion that takes place through the open neck is inconsiderable during the few hours that an aërial voyage lasts. Early aëronauts, who kept their balloons closed, frequently ran considerable risk by inattention to the valve when the imprisoned gas demanded vent for its expansion.

The art of traversing the air by means of balloons, generally called aëronautics, and sometimes aërostation, is of comparatively recent date. The germ of the invention of balloons is to be found in the discovery by Cavendish, in 1766, of the remarkable lightness of hydrogen gas, then called inflammable air. Prof. Black, of Edinburgh, seems to have been the first who conceived the idea that a light envelope, containing this gas, would rise of itself. He requested Dr. Monro, the professor of anatomy, to give him some thin animal membrane for the experiment, but for some reason or other, it was never made. The first practical attempts were made by Cavallo, who, in 1772, filled swine's bladders and paper-bags with the gas, but found the former too heavy, and the latter too porous; and he only succeeded in raising soap-bubbles inflated with the gas. The invention of the B. is due to the two brothers Stephen and Joseph Montgolfier, paper-makers at Annonay, in France, whose names are as distinguished in the development of their own branch of manufacture as in the history of aëronautics. It immediately struck these brothers, on reading Cavendish's *Different Kinds of Air*, that the air could be rendered navigable by inclosing a light gas within a covering of inconsiderable weight. Led by their avocation, they fixed upon paper as the most fitting material for the purpose, and first attempted to make balloons of paper filled with inflammable air. Finding that these emptied themselves almost as soon as they were filled, instead of abandoning the paper as an unsuitable covering for the gas, they sought after another gas more suited to the paper. By a chain of false reasoning which need not here be detailed, they thought they found such in the gas which resulted from the combustion of slightly moistened straw and wool, which had, as they imagined, an upward tendency, not only from its being heated, but from its electrical properties, which caused it to be repelled from the ground. It is hardly necessary to say that this so-called Montgolfier gas possessed no advantages for raising balloons other than that possessed by heated air of any kind; in fact, the abundant smoke with which it was mixed, by adding to its weight, rather detracted from its merits. At Avignon, in Nov., 1782, Stephen Montgolfier first succeeded in causing a silk parallelopiped, of about 50 cubic ft., to rise to the roof of a room. Encouraged by this success, the brothers made experiments on a larger scale at Annonay with an equally happy result; and finally, in June, 1783, in the presence of the states of Vivarais, and of an immense multitude, they raised a B., 35 ft. in diameter, to a height of 1500 feet. This last, nearly spherical in shape, was made of packcloth, covered with paper, and was heated by an iron choffer placed beneath it, in which 10 lbs. of moist straw and wool were burned.

The news of this extraordinary experiment soon reached Paris, where it produced a most lively impression. A commission was appointed by the academy of sciences to report upon it. Public curiosity, however, could not await the tardy decision of this body, and accordingly a subscription was entered into to defray the expense of repeating

the Annonay experiment. Such was the excitement that the subscription was filled in a few days, and the construction of the B. was intrusted to the brothers Robert, famous philosophical instrument-makers of the day, and to prof. Charles, a young but experienced physicist. As the detailed account of the Annonay ascent had not reached Paris, and as nothing was therefore known of the Montgolfier gas, Charles fixed upon hydrogen as the gas most likely to insure success. It was, however, a formidable undertaking to produce it in sufficient abundance for a B., as it was at that time only dealt with in small quantities in the lecture-room. By ingenuity and perseverance combined, he triumphed over this difficulty, and succeeded in filling, in the course of four days, a silk globe of 12 ft. in diameter. This B. was transferred to the Champs de Mars, the largest open space in Paris, where, on the 27th of Aug., 1783, it ascended in the presence of 300,000 spectators, half the population of the city. At the instance of the commission already referred to, Stephen Montgolfier constructed a fire-B., 72 ft. high, and 41 ft. in diameter. It ascended before the commission on the 12th of Sept., 1783, but being held captive, it was much injured by a violent wind which blew at the time, and after it descended it was finally broken up by heavy rains. Another was made of nearly the same dimensions, which ascended on the 19th of the same month at Versailles, the king and royal family "assisting" at the spectacle. This ascent is worthy of note, from the fact that a sheep, a cock, and a duck were placed in an ozier-basket attached to the lower part of the B., and that these first aërial voyagers reached the ground again in safety.

The B. was now a *fait accompli*, and it began to be seriously discussed whether it might not be serviceable as an air-ship for bearing men aloft as passengers. The solution of this question was first given by Pilâtre des Rosiers. In a Montgolfière, as the heated air-B. was called, 74 ft. high, and 48 ft. in diameter, supporting at its base a gallery of wicker-work, he, in company with the marquis d'Arlandes, made the first aërial voyage, 21st Nov., 1783. They remained in the air 25 minutes, and sailed across the Seine and over a considerable part of Paris. The year 1783, so fertile in the annals of aërostation, was destined not to pass away without witnessing an additional, and even more satisfactory, triumph. On the 1st of Dec., prof. Charles, along with Robert, rose from the Tuileries gardens with a hydrogen B.—then called a *Charlière*—made from the proceeds of a public subscription. This B. was made of alternately red and yellow gores of silk sewed together, and coated with caoutchouc varnish. It was covered with a net which supported the car, and was furnished with a valve, a barometer, and sand-ballast, and was, in fact, a complete aërial machine. It may be said that the art of aërostation at once attained perfection in Charles's B., and no essential change or improvement has taken place since. In consequence of the danger attending the use of fire-balloons, and the engrossing attention which they demand of the aëronaut, they have now entirely given way to the hydrogen or coal-gas balloons. Before they became obsolete, several remarkable voyages were made in them. The same Pilâtre des Rosiers made 30 leagues in one of them, the longest voyage ever executed in a Montgolfière. Among the names of the first professional aëronauts, those of Lunardi, Blanchard, and Garnerin deserve special note. Lunardi was the first who made the ascent in Great Britain; and Blanchard, along with the American Dr. Jeffries, crossed the English channel from Dover to Calais in circumstances of almost unparalleled danger, Jan. 7, 1785. Garnerin first descended from a B. by a parachute (q.v.), Oct. 22, 1797. It is much to be regretted that the first aëronaut, Pilâtre des Rosiers, fell a victim to a blind devotion to his art. In order to outvie Blanchard, he constructed a compound machine, consisting of a hydrogen B. above and a Montgolfière below, and started from Boulogne, accompanied by a young natural philosopher named Romain, on the morning of the 5th of June, 1785. He had not ascended many minutes, when, as it afterwards appeared, on attempting to open the valve of the hydrogen B. by the rope attached to it, he caused a rent of several yards in it, so that it emptied itself almost immediately, and fell on the Montgolfière beneath. The fire in the latter not being kindled, the whole machine fell with a frightful rapidity to the earth, and the ill-fated aëronauts perished on the spot whence they had risen. It is worthy of remark, that though several melancholy incidents of this kind are on record, the number of casualties in the navigation of the air has been less in proportion than in the navigation of the sea. For 1500 aëronauts and 10,000 ascents, calculating approximately, only 15 lives have been lost, certainly a small proportion considering dangers and inexperience.

In 1794, during the wars of the revolution, an aërostatic institution was formed at Meudon, near Paris, for training a corps of "aërostiers," in order to observe the enemy by means of balloons. A balloon under the management of this corps was present at the battle of Fleurus, near Charleroi, fought against the Austrians. During the siege of Paris, 1870–71, the B. was extensively employed. Countless letters and several persons left the beleaguered city in balloons. There was, of course, no attempt made to come back in such a conveyance: carrier-pigeons were the return messengers.

Balloons have been enlisted in behalf of science. The first ascent for scientific objects was made at Hamburg, July 18, 1803, by Robertson and Lhoest. The results obtained, more particularly regarding the diminution of terrestrial magnetism, and the general feebleness of electrical and galvanic phenomena in the rarer portions of the atmosphere, were considered of such importance by the French institute, that

another ascent was determined on; MM. Biot and Gay-Lussac were appointed to take the management of the B. and of the physical experiments; and they started, accordingly, on the 20th Aug., 1804. As this aërial expedition was not altogether successful, a second was undertaken by Gay-Lussac alone, in the same year, in which he rose to a height of 23,000 feet. The observations of the French savants did not confirm those made by Robertson, for after a series of experiments, as careful as their novel situation would admit, they found that no diminution was perceptible in the intensity of electrical phenomena in the upper air. Since then, many scientific aërial voyages have been undertaken, among which may be mentioned that by Humboldt in America; those made by Mr. Rush, in company with Mr. Green as steersman, on behalf of the British association, during 1847–49; and that by MM. Barral and Bixio (1850) at Paris. Recently, the most remarkable ascents have been made by Mr. Glaisher for meteorological observation. On one occasion he ascended to a height of 7½ m., the barometer standing at 7 inches. The B. contained 90,000 cubic ft. of gas, and carried 600 lbs. The hygrometric and thermometric laws of the air may yet be ascertained by B. ascents, as well as the nature of aërial currents, at present so imperfectly understood. The introduction of coal-gas, instead of hydrogen, by Mr. Green, is the most important advance in aërostation since the earliest days of the art. His large coal-gas B., in 1836, bore Messrs. Green, Holland, and Mason from London to Weilburg, in Nassau, distant 500 m., in 18 hours. Mention should also be made of the spindle-shaped navigable balloons of MM. Girard and De Lôme.

In the United States, aërostation has been prosecuted with great zeal. Mr. J. Wise has more than once exploded his B., when high up in the air, to show what he considers to be always the case, that the fragments with the net-work form in such circumstances a parachute, which moderates the rapidity of descent, and shields the aëronaut from danger. During 1859, the longest flight on record was made by Mr. J. Wise, Mr. La Mountain, and others, who, starting from St. Louis with the intention of reaching New York, succeeded in following the course they had mapped out for themselves until they had crossed lake Erie; when they were caught in an adverse current of air, and forced to abandon their original design, after having traveled 1150 m. in less than 20 hours. In Sept., 1859, Mr. La Mountain made a trip of 300 m. in 4 hours. Mr. Lowe, another American aëronaut, constructed an immense B., which he called an aërial ship, the greatest circumference of which was 387 ft., with a capacity to hold 700,000 cubic ft. of gas, and a lifting-power of 23½ tons, and furnished with many new appliances for elevating, depressing, and directing the machine.—See *Voyages Aériens* (Eng. edit. by T. Glaisher, 1871); *Les Ballons dirigeables*, Tissandier (1872); "Aëronautics" in *Ency. Brit.*; and *Quart. Rev.*, July, 1875.

BALLOT (in French, *ballotte*) is a little ball used in the practice of secret voting, which is thence generally called "voting by B.," whether it be a ball or a ticket that is used. Votes may be taken by B. in various ways—e.g., the voter may deposit a ball in either of two boxes, so conjoined that no one shall be able to say into which he drops it; or he may be presented with two balls—a white and a black—and so drop one of them into a box that it shall be unknown which he used. Tickets marked "Yes," "No," or with the names of candidates, will clearly serve the purpose of balls in private voting. The dicasts in Greece voted secretly by means of balls, stones, or shells, with marks. From this use of marked shells (Gr. *ostrakon*) in popular voting came the Greek *ostracism*, or secret vote of the people, by which they drove into exile those who became obnoxious to them. Tabulæ or tickets were chiefly used by the Romans. If the vote concerned a change in the law, the tickets were marked V. R., the initial letters of the words "Uti Rogas," expressing consent to the proposer's proposition; and A. for "Antiquo," expressing adherence to the old law. If the vote concerned the election of candidates to a public office, then the tickets bore the names of the candidates. The system of secret voting in Rome was fixed by various laws, of which the Gabiniana Lex most closely resembles the modern project of vote by ballot.

The system of vote by B. is much in use among moderns in private or social clubs, and in the election of officers and other acts of public or joint-stock companies. The propriety of employing it in private clubs has never been questioned, for to the harmony of these it is essential that the votes of a few should suffice to exclude an obnoxious person; and looking to the personal and invidious nature of the vote, it is equally essential to their harmony that the voting should be secret. A candidate for admission, who succeeds in the face of a few, though not a sufficient number of voters, could not but regard those who voted against him as enemies. But if the voting be by B., all he can know, if the voters keep their own counsel, is that some persons are unfriendly. It is thus left open for him to associate on friendly terms with all the members—a condition of the success and continuance of such associations. But whether the system was suited to political and municipal voting, used to be in this country the subject of keen debate, at a time when it was in use in France, in several of the United States, and in the Australian colonies.

We have said that the system prevailed in Greece, and on its fruit there—especially in the exercise of the ostracism—there have been various opinions. While some have considered that the Athenians, for instance, acted under cover of secrecy, frequently without a just sense of responsibility, there is the authority of Mr. Grote, in his *History*

of Greece, on the other side, to the effect that they exercised the right most beneficially. But if we have in Mr. Grote an advocate of the B., in Gibbon we have an opponent of it. In his *Decline and Fall of the Roman Empire*, that philosopher dates the decline of the republic from the introduction of secret voting, which, he says, destroyed public confidence—in effect, broke up the ancient relations of patron and client, and caused a general demoralization of the people. To come to modern times, we find the B. in use in the Venetian senate; and that in Britain it was first demanded, not for the purpose of elections, but of votes in parliament. In Scotland, during the revulsions against the court in the reign of Charles II., the system was actually adopted in the legislature; but it does not appear to have afforded voters in all cases the desired protection. No one would now dream of demanding its introduction in parliament, whose proceedings, according to popular opinion, cannot be too open and above-board. On this point it may be mentioned that secret voting was the rule, for over five years (from 1840 to 1845), in the chamber of deputies in France, when it was abolished, as being productive of abuse. This, however, as we have said, bears on a use of the system that has now no advocates. Two illustrations remain of its use in elections. In the colonies of Melbourne and Sydney, the B. is said to have worked well, though it has been doubted whether its efficacy has been properly tested in these countries, in which there is so much individual independence, peculiar to new countries, that those who vote care little for concealment. In the United States, on the other hand, it is said to be the general opinion that the system has proved inefficacious. In the state of New York, where the B. was adopted several years ago, there is now a party demanding open voting, as a cure for the evils introduced by the secret system. They say it has among the Americans opposed no effectual obstacle to coercion and intimidation from the majority, while those to whom the arrangements for secrecy are intrusted, flagrantly betray their trust, and the voters on either side are, as a rule, well known to the public.

The advocates of the B. used to maintain that it would prevent bribery, intimidation, and undue influence. They regarded its reputed failure in America as being beside the question as to its suitability for this country, because in America what the voter has to contend against is the pressure of the many, while with us he seeks to resist coercion by individuals. The tenants, for instance, they said, want security, through concealment, against the loss of their farms, should they vote against the wishes of their landlord. They believed it would prevent bribery, through the uncertainty that the bribed party would vote as he promised. And as a candidate would not give bribes, because he could not trust that he would get value for his money, so intimidation would not be attempted in the absence of any security that it would be of effect. To this it was answered, on the other side, that the case of America was in point, inasmuch as intimidation might arise here, as there, from a majority, and that the case of a shopkeeper and his patrons was that of many against one all over the world. If the B. failed to protect the unit against the crowd in one country, how could it succeed in another? As to the undue influence of individuals over many—as of a landlord over his tenants—it could only be prevented providing the many, in all their public acts, contradict their secret votes. If the many acted publicly as if they agreed with the few, and privately voted against them, we should have had a state of things in which the professed public opinion would have been in antagonism with the public policy, supported by private votes—a state of things justly regarded as being impossible to be produced. The influence of individuals, then, must remain—i.e., the secret voting would be of no use, since, short of lifelong hypocrisy, it must fail to be a protection. As to bribery, the opponents of the B. thought better of human nature than those who would purify it by machinery. "Honor among thieves," they said: "he who takes a bribe, either has no principle left in him for which to vote contrary to his promise, or will be guided by his deceased sense of honor." On the other view, they put it, you secure the vote of a rogue, through his playing the knave doubly, by the public in taking the bribe, and by the briber in not fulfilling his pledge. That men will be inclined to give and take bribes as formerly, despite the somewhat diminished security, they appeared not to doubt.

An element in the controversy was the question whether the franchise was to be regarded as a public trust, or a private power to be used at the individual's discretion. The opponents of the B. maintained the franchise to be a trust, on which view, certainly, it should be openly exercised. Its advocates, on the other view, held the object of the franchise to be the ascertainment of the conscientious opinions of the people. The fact is, the right partakes of both characters: it is a power of expressing opinion by the agent under a sense of responsibility. The B. gives greater security for independence of thought; but the public vote is attended by the greater security for sense of responsibility. It used to be common to sprinkle pleas against the B. with high praise of the whole scheme of British politics, as open, manly, and candid, and with expressions of contempt for the B., as sneaking, and dissonant with that scheme. But the advocates of the B. were not unprepared with a ready and obvious retort to such arguments. Public feeling was kept alive on this question by annual motions in parliament. From 1835, its introduction was an open question with the whigs. The radicals, in 1859, were greatly pleased to find lord John Russell expressing himself as being almost a convert to their views. The controversy was put an end to in July, 1872, when voting at parliamentary and municipal elections in Great Britain and Ireland was decreed to be by ballot.

BALLO'TA. See HOREHOUND.

BAL'LOT FOR MILITIA. See MILITIA.

BALLOU, HOSEA, 1771–1852; b. N. H.; minister of the Universalist denomination; son of a Baptist minister. He was self-educated; was expelled from his father's church on declaring his belief in the final salvation of all men; began to preach at 21 years of age, and became minister of the Second Universalist church in Boston, in which he preached 35 years. He started the *Universalist Magazine* in 1819, and in 1831, with his grand-nephew, began the *Universalist Expositor*, a quarterly publication. It is said that he preached over 10,000 sermons, none of which were written before delivery. His brothers, David and Benjamin, were also preachers of the same faith.

BALLOU, HOSEA, 2d, D.D.; 1796–1861; b. Vt.; the grand-nephew of Hosea of Boston; was pastor in Connecticut and Massachusetts, and in 1853 president of Tuft's college. He was one of the editors of the *Universalist Magazine*, now published under the name of *The Trumpet*. He was the author of *Ancient History of Universalism*, etc.

BALLOU, MATURIN MURRAY, son of Hosea of Boston; b. Boston, 1823; editor of several literary journals, author of a biography of his father, *History of Cuba*, and compiler of the *Treasury of Thought*. He is one of the editors of the Boston *Globe*.

BALLS, HOLLOW. In military pyrotechny, many varieties of B. are made, differing in purpose from bomb-shells, but, like them, filled with ignitible composition. They are used to give light, to produce a dense smoke, or to diffuse a suffocating odor. Some of them, though called B., are not globular in shape. *Light-B.* consist of canvas stretched over a skeleton frame, and painted; the frame is filled with a composition of saltpeter, sulphur, resin, and linseed-oil, rammed down hard; and is provided with a fuse, the length of which determines the time that will elapse before the composition ignites. These light B. weigh from 5 lbs. to 70 lbs. each, according to their size. They are intended to give out a brilliant light, which may reveal the operations of the enemy during night at a siege or in the field. *Smoke-B.* are made of several thicknesses of paper, shaped by means of a globular core or mold. They are filled with gunpowder, saltpeter, powdered sea-coal, Swedish pitch, and tallow; and are calculated, after being fired off, to send out a dense smoke for nearly half an hour, in order to blind or incommode the enemy. *Stink-B.* are filled with a composition which, when ignited, diffuses an odor almost intolerable. Some of the contrivances of capt. Norton and other inventors at the present day, noticed under ASPHYXIANTS, are extensions of the same principle as these inflammable balls. It may here be added, that most of these projectiles, especially light-B. and smoke-B., are fired from mortars rather than from guns.

BALL'S BLUFF, on the Potomac, 33 m. above Washington, the scene of a defeat of the union forces under col. E. D. Baker, in the first year of the rebellion, Oct. 21, 1861. The conflict was severe, and the union troops, from 1500 to 1700 in number, were utterly defeated, their loss exceeding 1000 men; the confederate loss was reported to be 155. Baker was blamed for rashness, and gen. Stone was imprisoned, but afterwards released and given a command.

BALLSTON SPA, seat of justice of Saratoga co., N. Y.; 7 m. w. of Saratoga springs; once much frequented as a watering place, but long since over-shadowed by its neighbor. Pop. '70, 2970.

BA'LLY, or BAL, a Celtic word or prefix, signifying "town" or "dwelling," enters into the composition of hundreds of names of places in Ireland and Scotland. It is allied (see letter B) to Gr. *polis*, city, and to the Lat., Ital., and Span. *villa*.

BALLYCASTLE, a small seaport t. in the n. of Antrim co., Ireland, in an open bay opposite Rathlin isle, 88 m. n. of Belfast, and 5 m. s.w. of Fairhead. It lies at the base of Knocklayd mountain, 1635 ft. high; and the marine and mountain scenery around is very romantic. B. consists of an upper and lower town, a quarter of a mile apart. Its harbor and pier cost £150,000, but the former is now filled with sand. Coal was dug here at least 500 years ago. Linen manufacture and salmon-fishery are carried on here. Near B. are the Bonnamargy Abbey ruins. There is a singular fissure, called the "gray man's path," in the face of a greenstone precipice near B. on the way to Fairhead. Pop. '71, 1739.

BALLYME'NA, a small inland t. in the center of Antrim co., Ireland, in a plain, on the right bank of the Braid, 2 m. above its junction with the Maine, and 33 m. n.n.w. of Belfast. It lies in a densely peopled and well-cultivated district, the inhabitants uniting the pursuit of agriculture with the manufacture of linen. B. is one of the greatest linen and flax markets in Ireland, and its vicinity is covered with extensive bleach-fields. Pop. '71, 7931.

BALLYSHANNON, a small seaport t. in the s. of Donegal co., Ireland, the chief t. of the co., though not the capital. It is situated at the mouth of the river Erne, on a small inlet running off from Donegal bay, and 120 m. n.w. of Dublin. A bridge of 14 arches crosses the Erne here. The Erne discharges more water than any other Irish river except the Shannon, and falls 140 ft. over a rugged bed in the last 9 m. of its course; 400 yds. below the bridge at B. the river falls in a cataract 16 ft. high at low water, and 450 ft. wide, over a limestone ledge of rock. The chief streets of B. are very steep.

There is a valuable salmon-fishery on the river. The export trade is small, in consequence of the existence of a bar at the mouth of the harbor and the prevalence of w. winds. Pop. '71, 2958.

BALM, *Melissa officinalis*, an erect, branching, perennial, herbaceous plant of the natural order *labiatæ*, a native of the s. of Europe, naturalized in a few places in England. It has ovate crenate leaves, and axillary half-whorls of white flowers on one side of the stem. The whole plant has an agreeable lemon-like smell, on account of which it is frequently cultivated in gardens. The stems and leaves are used in medicine as a gentle aromatic, stimulant, and tonic. B. is also employed for making an agreeable and somewhat exhilarating beverage called B. wine. B. was formerly in much higher repute than now for its medicinal virtues. Its qualities depend on an essential oil of a pale yellow color called oil of balm.

For medicinal use, the herb should be cut before the appearance of the flowers, which begin to expand in July. It is nearly inodorous when dried. The taste is somewhat austere and slightly aromatic. B. scarcely produces any remedial operation upon the system. The quantity of oil which it contains is not more than sufficient to communicate a pleasant flavor to the infusion, which forms an excellent drink in febrile complaints, and when taken warm tends to promote the operation of diaphoretic medicines. —A variety of the common cat-mint (*nepeta cataria*) with a smell like that of B. is often mistaken for it.—MOLDAVIAN B. (*dracocephalum Moldavicum*) is a native of the country from which it derives its name and of Siberia, etc.; an annual plant having, when fresh, a smell like that of B., but less pleasant. It is much used in Germany for flavoring dishes.—BASTARD B. (*melittis melissophyllum*), a native of the s. of England and of many parts of Europe, is a very beautiful plant which when dried has a delightful fragrance and retains it long. All these are of the natural order *labiatæ*.

BALMEZ, JAIME LUCIEN, 1810–48; a Spanish ecclesiastic, philosopher, and author. His most important work is *Protestantism Compared with Catholicism in their Relation to European Civilization*, a very able defense of the Roman church. He wrote also *Fundamental Philosophy*, and a *Course of Elemental Philosophy*.

BALM OF GIL'EAD. See BALSAM OF GILEAD.

BALMO'RAL CASTLE, the autumnal residence of her majesty queen Victoria, is situated in a beautiful dell in Braemar (the s.w. district of Aberdeenshire) on a natural platform that slopes gently down from the base of Craigan-gowan to the margin of the river Dee in front and about 48 m. w. of the city of Aberdeen. The castle commands a magnificent prospect on all sides. In 1848 prince Albert purchased the reversion of a 38 years' lease from the representatives of Sir Robert Gordon, who had held it under the earl of Fife, and in 1852 he acquired the fee-simple of the estate from the Fife trustees for the sum of £32,000. The old castle not being sufficiently commodious for the royal family, prince Albert erected a new one at his own expense, in what is called the Scottish baronial style of architecture. The castle consists of two separate blocks of building united by wings and a massive tower 35 ft. sq., rising to the height of 80 ft., surmounted by a turret 20 ft. high. At a distance the castle, which is built of granite, has a strong and imposing appearance, looking almost as if it had been hewn out of one huge rock of that material. Great improvements have been made, chiefly those projected by the late prince Albert, in the approaches to the royal residence. The estate now includes Birkhall, Knock Castle ruins, Loch Muick, and "dark Lochnagar," celebrated by Byron (which is about 7 m. s.w. of B. C.), and contains about 10,000 acres, in addition to 30,000 acres of hill-ground which have been converted into a deer-forest.

BAL'NAVES. HENRY, of Halhill, an eminent lay-reformer of the 16th century. Born at Kirkcaldy in Fifeshire of poor parents, who, however, contrived to give him a university education at St. Andrews, he went to the continent, and entered a free school at Cologne, where he greatly improved his scholarship, and received instruction in the principles of the new faith which Luther had just promulgated. On his return to Scotland, he studied law, and acted for some time as a procurator at St. Andrews. In 1538, James V. made him a senator of the college of justice; and on Arran being appointed to the regency, B. was made secretary of state. In 1543, he was imprisoned on account of his Protestantism, but appears to have been liberated in the following year. He now appears to have made himself active on the Protestant side; and it is asserted that he was privy to the conspiracy formed for the murder of cardinal Beaton, and that he acted for the conspirators at the English court. In 1547, he took refuge in the castle of St. Andrews, and was declared a traitor and excommunicated. When the castle was captured by the French, B., with Knox and others, were sent to Rouen as prisoners of war. While in prison here, B. wrote a treatise on justification, to which Knox added marginal notes, and prefixed a dedication, and which was afterwards published with the title of *The Confession of Faith*. When Mary of Guise was raised to the regency in 1554, B.'s forfeiture was rescinded, and he returned to Scotland, and took an active part on the side of the lords of the congregation, by whom he was appointed one of the commissioners who settled the treaty of Berwick in 1559–60, which established by law the reformed religion in Scotland. In 1563, B. was nominated a commissioner to revise

The Book of Discipline. He afterwards acted for the regent Murray in the inquiry into the charges against Mary for the murder of Darnley. He d. in 1579; one account says 1570. Both Knox and Melville had a high opinion of him alike for his piety, wisdom, and learning.

BALOTRA, a t. of India, in the Rajpoot state of Joudpore, 59 m. s.w. of the city of Joudpore. It is situated on the right bank of the river Loonee. Being on the high-road from Joudpore to Dwarka, a celebrated place of pilgrimage in the w. of Guzerat, it is a great resort of pilgrims, with whom its bazaar is often crowded. Many of the inhabitants of the town subsist by providing for their wants. The town is supplied with good water from 125 wells, lined with masonry. Pop. 7275.

BALSAM, a name formerly comprehensive of many resinous substances and oils, to which important medicinal virtues were ascribed, as well as of medicines compounded of resins and oils. When the term B. is now used without addition, the balsams of Peru and Tolu are generally intended.—These two balsams are very similar in all their more important properties, and are both produced by trees of the genus *myrospermum* (or *myroxylon*), of the natural order *leguminosæ*, sub-order *papilionaceæ*, natives of the tropical parts of America. *M. Peruiferum*, which is called the quinquino, a beautiful tree, common from Peru to Mexico, is generally regarded as the species which produces the B. of Peru; and *M. Toluiferum*, a very similar species, found on the mountains of Tolu, the banks of the Magdalena, etc., as that which produces the B. of Tolu; but it is doubtful if the difference is not at least as much owing to the modes of procuring and preserving the B.; and other species of the same genus (*M. punctatum* and *M. pubescens*) are supposed also to yield it. B. of Peru appears in two forms, known as *white B. of Peru* and *black B. of Peru;* the former of which has been said to be obtained from the pods, and the latter from incisions in the trunk of the tree; but it has also been stated that the white B. flows from the trunk, and that the black B. is obtained by distilling down the wood after the manner of tar-burning, or by boiling with water. The actual evidence is insufficient to determine these points with certainty, and it is not improbable that different methods may be employed. White B. of Peru is at first of the consistence of recent honey, and of a light yellow color; the black B. is of a reddish or blackish brown color, and of the consistence of treacle. B. of Tolu, until recently, appeared in commerce dry and friable, but is now generally soft and tenacious when first imported, becoming hard by age. Both balsams have a very fragrant odor. They are used in confectionery, to impart a flavor like that of vanille; also in perfumery, and for pastilles, etc. In medicine, they are administered as gentle stimulants and tonics, and particularly in chronic bronchial affections. *Tolu lozenges* are a popular and pleasant remedy for troublesome coughs. These balsams are also used for cleansing ulcers.—They contain cinnamic acid, and a peculiar oily substance which has been called *cinnameine*, and is also known as oil of B. of Peru. The name *white B. of Peru* is sometimes given to a balsamic substance which flows from the *liquidambar styraciflua*. See LIQUIDAMBAR.

BALSAM, or BALM OF GILEAD, is a liquid resinous substance, which has long enjoyed a very high reputation in the east, being prized not only for its fragrance, but also for the medicinal virtues which it is supposed to possess. It is the subject of several allusions in the Old Testament, which strongly indicate the prevalent opinion of its preciousness; and is celebrated by Strabo, Pliny, Diodorus Siculus, and other ancient writers, almost as a cure for every disease. It is still somewhat doubtful what tree furnishes it, but it is generally believed to be a species of *balsamodendron* (q.v.)—a small tree growing in Arabia and Abyssinia, and known as *B. Gileadense.* The finest balsam, called opobalsam or balm of Mecca, is obtained by incisions, is at first turpid and white, but finally becomes of a golden yellow color, and of a consistence like honey. Inferior kinds are obtained by boiling the fruit and the wood. B. of Gilead is irritating when applied to the skin, and is believed to resemble B. of copaiva in its effects upon the human system. *Balsamodendron opobalsamum*, a species very nearly allied to *B. Gileadense*, is sometimes said to furnish this balsam.

Other substances, sometimes designated balsams, and possessing a somewhat similar fragrance, are produced by different species of *amyridaceæ* (q.v.). Among them is one called American balm of Gilead, the produce of a tree called *icica carana.*—Balsamic substances are furnished also by a number of species of *clusiaceæ*—balsam of Umiri, a fragrant yellow fluid, by *humirium floribundum*, a South American tree, of the natural order *humiriaceæ.*—CANADIAN BALSAM is a kind of turpentine obtained from the Balm of Gilead fir (*abies balsamea*); HUNGARIAN BALSAM, from the mugho or mountain pine (*pinus pumilio* or *mughus*); and CARPATHIAN BALSAM, from the stone pine (*pinus pinea*). See FIR and PINE.—BALSAM OF COPAIVA is the produce of different species of *Copaifera.* See COPAIVA.

BALSAM is also the common name of a natural order of succulent herbaceous plants, *balsamineæ* or *balsaminaceæ* of botanists, of which the beautiful B. (*impatiens balsamina* or *balsamina hortensis*), so much cultivated in gardens and green-houses, is a familiar example. Upwards of 100 species are known, natives chiefly of damp bushy places in the East Indies, and many of them plants of great beauty. They are almost all annuals, and have generally white or red flowers. This natural order is very closely allied to *geraniaceæ* (see GERANIUM) and *oxalideæ* (q.v.), wood-sorrel, etc., but is distinguished

from both by the extreme irregularity of the flowers, and from the former also by the beakless fruit, which is a five-celled capsule, bursting by five elastic valves. The leaves are simple and without stipules, the flowers generally axillary.—The common B. is a native of the East Indies and Japan. Many fine varieties have resulted from careful cultivation. It has an upright succulent stem, usually about 1 to 2 ft. high, but in favorable circumstances will attain a greater size. It often appears with flowers partially double, but still capable of producing seed. In Britain, the seed is usually sown on a slight hot-bed, and the plant is often kept in the green-house; although even in Scotland it may be made an ornament of a sheltered border. It is one of the flowers frequently to be seen in cottage windows. A vulnerary was formerly prepared from it, whence it has its name. One species of B. (*impatiens noli-me-tangere*), called yellow B. or touch-me-not, is a native of Europe, and a doubtful native of Britain. It has yellow flowers, and one of the petals prolonged into a spur. Its ripe capsules burst on the slighest touch. This and two other species are natives of North America.

BALSAMODENDRON (Gr. balsam-tree), a genus of small trees or bushes of the natural order *amyridaceæ* (q.v.), having small green axillary flowers, small dry oval fruits, and small pinnated leaves with 3 or 5 leaflets. Some of them are spiny: they generally exhibit a scrubby appearance, and have little foliage. They are remarkable for the balsamic substances obtained from their wood and fruit—as balsam of Gilead (q.v.), myrrh (q.v.) bdellium (q.v.), and oriental elemi (q.v.). The red resinous wood of *B. kataf* is a common article of sale in Egypt; and a species called schnee is much cultivated in Afghanistan for its aromatic and stimulant properties. All the known species are natives of the East Indies, Arabia, and the e. of Africa, except that which yields African bdellium, which is found in Senegal.

BALSAM OF SULPHUR is a mixture employed for medicinal purposes, and considered of service when applied to foul ulcers. It is prepared by dissolving 1 part of flowers of sulphur in 8 parts of olive oil, which yield a dark, reddish brown, thickish substance, with a very unpleasant odor.

BALTA, a well-built and thriving t. on the Kodema, an affluent of the Bug, in the government of Podolia, Russian Poland. Pop. '67, 14,528.

BALTARD, Louis Pierre, 1765–1846; a French architect and engraver. He is known chiefly by his skill in engraving, specimens of which are found in *Paris and its Monuments*, Denon's *Egypt*, and illustrations of Napoleon's wars in *La Colonne de la grand Armée*. His son Victor, b. 1805, was architect for the French government and the city of Paris, and a member of the academy of fine arts. He built St. Augustine's church and other fine edifices.

BALTIC, a village in New London co., Conn., 42 m. e.s.e. of Hartford. It has one of the largest cotton manufactories yet built, running about 60,000 spindles.

BALTIC PROVINCES (in Russia). This term, in a wider sense, comprehends the five Russian governments bordering on the Baltic—viz.: Courland, Livonia, Esthonia, Petersburg, and Finland; in a restricted sense, it often designates the first three. The B. P. once belonged to Sweden, except Courland, which was a dependency of Poland. They came into the possession of Russia partly in the beginning of the 18th c., through the conquests of Peter the great, partly under Alexander in 1809. They have still very various constitutions, though the usual "government" machinery has been introduced, and every effort is made completely to Russianize them. The five governments have an area of about 200,000 sq.m., with a pop. in '70 (Finland in '75) of 5,126,497, including St. Petersburg.

BALTIC QUESTION, the controversy between the provinces of Esthonia, Livonia, and Courland, and the government of Russia. Peter the great promised to the provinces their own German administration, and freedom of conscience; and these rights were confirmed in 1856, but in spite thereof, the Greek church endeavors to proselyte the people, efforts are made to compel the substitution of the Russian for the German tongue in schools, and the press has been subjected to censorship.

BALTIC SEA, is the great gulf or shut sea bordered by Denmark, Germany, Russia, and Sweden, and communicating with the Kattegat and North sea, by the Sound and the Great and Little Belts. Its length is from 850 to 900 m.; breadth, from 100 to 200; and area, including the gulfs of Bothnia and Finland, about 160,000 sq. miles. Its depth is on an average 15 to 20 fathoms, in many places not so much, seldom more than 40 to 50, and never exceeding 167. Its shallowness and narrowness, the flat coasts of Prussia on the one side and the rocky coasts of Sweden on the other, and above all the numerous and sudden changes of wind accompanied by violent storms, make the navigation of the Baltic very dangerous. The group of the Aland islands divide the s. part of the sea from the n. part or gulf of Bothina (q.v.). The gulf of Finland (q.v.), branching off eastwards into Russia, separates Finland from Esthonia. A third gulf is that of Riga or Livonia. The Kurisch and other haffs (q.v.) are not gulfs, but fresh-water lakes at the mouths of rivers.

The water of the Baltic is colder and clearer than that of the ocean. It contains only a fifth of the salt of the Atlantic, and ice hinders its navigation from three to five months yearly. Tides, as in all inland seas, are little perceptible—at Copenhagen

about a foot; yet the water rises and falls at times, though from other causes, chiefly from the varying quantity of water in the rivers at different seasons. Upwards of 250 rivers flow into this sea. The chief from Germany are the Trave, Warnow, Oder, Rega, Persante, Vistula, Pregel, and Niemen; from Russia, the Windau, Düna, Narva, Neva, and Ulea; and from Sweden, Tornea, Lulea, Pitea, Umea, Angerman, Dal, the water of lake Maeler, and that of Wetter and other lakes through the river Motala. The basin of the Baltic occupies at least 880,000 sq. m., or about one fourth of all Europe; and only about a fourth of the boundary of the basin is mountainous. The principal islands are Zealand, Fünen, Bornholm, Samsöe, Möen, Langeland, and Laaland, belonging to Denmark; the Swedish islands Gottland, Oland, and Hveen (in the Sound); the Aland islands, Dagö, and Oesel, belonging to Russia; and Rügen, to Prussia. The number of vessels that pass the Sound to or from the Baltic annually is very large. See SOUND DUTIES. Timber, hides, tallow, and grain are the chief exports from the countries bordering on the Baltic. The Eider or Schleswig-Holstein canal, connecting the Baltic near Kiel with the North sea at Tonningen, facilitates the grain trade in mild winters. The two seas are also connected by the Gotha canal, which joins the lakes of s. Sweden. The most important harbors in the Baltic are: in Denmark, Copenhagen and Flensburg; in Germany, Schleswig, Kiel, Travemünde (Lubeck), Wismar, Rostock, Stralsund, Stettin, Swinemünde, Danzig, Elbing, Königsberg, Pillau, and Memel; in Russia, Riga, Revel, Narwa, Cronstadt, and Sveaborg; and in Sweden, Stockholm, Carlskrona, and Ystad.—The shores of the Baltic in Prussia and Courland have been long noted for the amber cast ashore by the waves in stormy weather. Another important phenonemon connected with the Baltic, is an alleged slow vertical movement of its coasts, *downwards* in the s. of Sweden, but further n. *upwards*, being there supposed to be at the rate of 3 ft in a century. See Lyell's *Principles of Geology*.—The Germanic nations call this sea *Ostsee*, or Eastern sea; the name Baltic is derived by Dr. Latham from an island Baltia, mentioned by Pliny, and which Dr. Latham considers to be Zealand.

BALTIMORE, a co. in n. Maryland, on Chesapeake bay; 700 sq.m.; pop. '80, 415,524—64,264 colored. The surface is somewhat hilly. It produces corn, tobacco, wheat, and garden vegetables. Co. seat, Towsontown.

BALTIMORE, a city, port of entry, and seat of justice of Baltimore co., Maryland, U. S., in lat. 39° 17′ n., and long. 76° 36′ w. It stands round a small bay which runs back from the left side of the Patapsco, about 12 m. from its entrance into Chesapeake bay, and about 200 m., by a ship's course, from the open Atlantic. The city was founded so late as 1729. The surest test of its prosperity is to be found in the rapid increase of its population. In 1800, there were 26,514 inhabitants; in 1810, 46,455; in 1830, 80,620; in 1840, 102,513; in 1850, 169,054; and in 1870 there were 267,354. Besides its safe and convenient communication with the sea, B. is connected by railway with Philadelphia, Washington, Winchester, Annapolis, Cumberland, York, Lancaster, Harrisburg, etc. From e. to w., the city is about 4¼ m. long; and from n. to s., about 3¼ broad, and covers about 10,000 acres. It is divided into two nearly equal parts by "Jones's Falls," a rapid stream which, though troublesome from its floods, and expensive from its bridges, supplies immense water-power, and an abundance of pure water for domestic use.

In 1874, imports were $26,578,554; and exports, $28,617,590. B. has a very extensive grain trade, and is one of the largest flour depots in the world. It is the chief market for tobacco in the country, and its manufactures are very important. In the year ended June 30, 1874, 2143 vessels, of 1,103,446 tons, entered and cleared the port in the foreign trade. There are 25 newspapers.

Among the commemorative structures which have gained for B. the name of the "Monumental City," the most interesting is an elegant obelisk, erected in 1815 to the memory of those who had fallen in defending the town against the British. The Roman Catholic cathedral takes the lead among the ecclesiastical edifices of B. It is a massive building of granite, being 190 ft. long, 177 broad, and 127 high; and besides one of the largest organs in the United States, it contains two beautiful paintings, presented by Louis XVI. and Charles X. of France. In B., however, the Roman Catholics have now only 23 churches out of 189. The new city hall is one of the finest buildings of the kind in the United States, and there are numerous handsome educational and charitable institutions.

BALTIMORE (*ante*), the chief city in Maryland. The colonial assembly in 1729 passed a bill for laying out a town in Baltimore co., on the n. side of the Patapsco. The earliest patent for land there was by Charles Gorsuch, a quaker, who received 59 acres on Whetstone Point, in 1662. Twenty years later David Jones settled on the n. side of the harbor, giving his name to the stream known as "Jones's Falls," which divides the "old" from the "new" towns. In Jan., 1730, a small town was located n. of Jones' Falls, and named B., in honor of Calveri, lord B. At the same period William Fell, a ship-builder, settled at Fell's point, and two years later another town was projected and named after David Jones. That town was joined to B. in 1745, dropping its name. By successive unions these little settlements passed into B., and in 1752 the future city had about two dozen houses and 200 inhabitants. In 1756, a number of the people

expelled from Nova Scotia came to B.; in 1767 B. was made the county seat, and the usual courts were established, a court-house being built on the site of the present battle monument, standing, with its antiquated whipping-post near by, until 1808. The first newspaper was begun in 1773, a theater was built, and a stage line to Philadelphia and New York established. When the revolution came, B. had about 570 houses, and nearly 6000 inhabitants. In 1776, the continental or provincial congress, fearing British interference at Philadelphia, met in B. in quarters thus described by John Adams: "The congress sit in the last house at the w. end of Market street, on the s. side of the street, in a long chamber, with two fire-places, two large closets, and two doors. The house belongs to a quaker, who built it for a tavern." A custom-house was opened in 1780, and a market in 1784, in which year a few oil lamps were set in the main streets, and watchmen were employed. Trade and commerce began soon after peace, and the city grew rapidly. Though originally a Roman Catholic colony, there came, after the revolution, a number of enterprising Scotch-Irish Protestants, whose energy and means were of great value to the city. Stage lines and packets were established to distant places, turnpikes projected, and in 1789 the course of Jones' Falls within the city was changed, and the original bed of the stream filled in. In 1792, there was an accession to the population of many refugees from San Domingo. By 1796, the inhabitants numbered 20,000, and B. was made a city and chose a mayor. During the last war with Great Britain, a force under col. Ross advanced against B., Sept. 12, 1814, and a sharp conflict ensued, in which the English colonel was slain; but the Americans were defeated with heavy loss. Still the projected assault on the city was abandoned. The entrance to the port of B. is defended by fort McHenry, on the point of land between the harbor and the Patapsco. It was during an unsuccessful bombardment of this fort by the British fleet, in 1814, that Francis Scott Key, an American prisoner on one of the English ships, composed the celebrated "Star-Spangled Banner." The city became conspicuous early in the civil war. April 19, 1861, a portion of the 6th Massachusetts and 7th Pennsylvania regiments was mobbed while passing through the city, and in the contest, nine citizens and two soldiers were killed, and three citizens and 23 soldiers wounded. No more troops were sent through B. until the city was put under military rule.

B. is on undulating ground, covering about 10,000 acres, 4½ m. from e. to w., and 3½ from n. to south. It is almost equally divided by Jones' Falls, which is crossed by several bridges. The region e. of the stream is nominally divided into two parts, Old Town and Fell's Point. The Point is the resort of seamen, and a place of ship-building and manufacturing. On the w. of Jones' Falls are the city proper and Spring Garden, the former being the center of trade and the home of the wealthiest citizens: the latter inhabited by the poorer classes and once noted for rowdyism; "My name is Jake Keyser; I was born in Spring Garden," is a song not yet forgotten.

B. has more than 200 churches, three universities, a number of colleges, and many charitable and beneficial institutions, among which are the Bay View asylum: the Spring Grove asylum; the Maryland institution for the blind; the Sheppard asylum for the insane, endowed with $1,000,000 by Moses Sheppard; the Peabody institution, which received over $1,000,000 from George Peabody; the Hopkins hospital, endowed with $2,000,000 by John Hopkins, free without regard to color or condition. The Johns Hopkins university (which see) is a new institution, magnificently endowed, giving opportunity for post-graduate study, and advanced scientific research, and gradually developing its various courses of study on a far-reaching plan. There are about 125 public schools, with 80,000 average attendance. The most notable building in B. is the new city hall, occupying an entire square of more than half an acre; 355 ft. long, in renaissance style; the outer facing of the walls, the portico, and all the ornamental work of white Maryland marble; the inner walls and floors of brick; four stories high, surmounted by a mansard roof of iron and slate, with a dome and tower of iron, rising 240 ft. from a marble base. The interior is very elegantly furnished, and the whole cost was $2,600,000. It is said to have been built entirely within the original estimate of expense. The Peabody institute was incorporated in 1857; one wing of the building, near the Washington monument, is completed. It is faced and ornamented with white marble, and is simple, but massive and imposing in style. It contains a library of 56,000 volumes, and halls for lectures, concerts, etc. The custom-house is a fine edifice, 225 by 141 ft.; the principal room is 53 ft. square, and is lighted by a glass dome, 115 ft. above the street. On the four sides are colonnades, each column being a single block of Italian marble.

B. is supplied with water from lake Roland (fed by Jones' Falls), an artificial pond 8 m. n. of the city, with a capacity of 500,000,000 galls. There are three other reservoirs, with an aggregate storage of as much more. There are also numerous small springs and fountains in the city. Of a number of public squares, Druid Hill park, of 700 acres, in the extreme n.w. of the city, is the chief, and possesses wonderful natural beauty, including forests, lakes, lawns, and about 25 m. of carriage drives.

As a manufacturing city, B. takes high rank in ship-building; in products of iron, wool, copper, cotton, and pottery; in sugar-refining, distilling, tanning, saddlery, the making of agricultural implements, etc. Near the city is clay for bricks, which is not excelled by any known in the world, and more than 100,000,000 B. bricks are made and sold annually. The largest iron-rolling mills in the United States are the Abbott works,

in the e. section of the city. As a flour market, B. is an important center; and it is also prominent in exporting tobacco, and other products. One of its features is the oyster trade. The oysters are taken from Chesapeake bay in immense quantities, canned, and shipped to all parts of the world.

In order of population, B. is the sixth city in the United States. Its progress as shown by the census has been rapid. 1790, 13,503; 1800, 26,514; 1810, 35,583; 1820, 62,738; 1830, 80,625; 1840, 102,313; 1850, 169,054; 1860, 212,418; 1870, 267,354; 1880, 332,190.

BALTIMORE, Lord, Sir George Calvert, of the Irish peerage created in 1624 by James I., who gave the title to his zealous Roman Catholic defender. Lord B. was of English birth, a graduate of Oxford, principal secretary of state in 1619, and member of parliament in 1620–21. He tried to establish a colony in Newfoundland, in 1625, but failed. He visited Virginia, but not being well received, returned to England, where he died. It was to his son, Cecil Calvert, that the Maryland patent issued in 1632. He never came to this country, but sent settlers under his brother Leonard. Cecil succeeded to the title, whence it passed to John and his heirs until 1771, when it died with Frederick, who had no children.

BALTIMORE-BIRD, or Baltimore Oriole, *Ic'terus Baltimorii*, a very beautiful American bird, found in all parts of the United States, and as far n. as 55° n. lat., but migrating to tropical or subtropical regions in winter. The genus to which it belongs is usually referred to the natural family of *sturnidæ* (see Starling). The B.-B. is in size somewhat less than a common starling; the bill conical, very acute, and a little curved; the plumage brilliant, particularly in the adult males, glossy black finely contrasting with bright orange and vermilion; the tail longish, rounded, and slightly forked. The bird is remarkably active and lively; its song extremely agreeable. Its nest is a curious and interesting structure—a pendulous cylindrical pouch of 6 or 7 in. long, usually suspended from two twigs at the extremity of a lofty drooping branch; the materials, which vary according to circumstances, being woven together with great nicety. It is sometimes sewed through and through with long horse-hairs. Thread, which may happen to be bleaching, is very liable to be appropriated to the purpose of nest-building.

The nests of other species of *icterus* are also pensile. Several are natives of North America, and others of South America. They are quite distinct from the true orioles (q.v.).

BALTSCHIK', or Baldjik', a t. of European Turkey, 18 m. n.e. of Varna, noteworthy in consequence of being in the vicinity of the ruins of Tomi, to which place Ovid was exiled.

BALTZER, Wilhelm Eduard, b. 1814; studied at Leipsic and Halle; was hospital chaplain at Delitzsch, and in 1847 founded, at Nordhausen, a free religious community. In 1848, he was chosen to the Frankfort parliament, and subsequently to the Prussian assembly. In 1868, he established a society and a journal to promote vegetarianism. He has written many works on religious topics, including a *Life of Jesus*.

BALUCHISTAN'. See Beloochistan, *ante*.

BALUSTER, popularly, *banister* or *ballaster* (Ital. balaustro; Fr. balustre) the name given to the small shafts or pillars set in a line at short equal distances, and supporting a cornice or coping. These miniature pillars have generally either a pear-shaped swelling at the lower end, or consist of two pear-shaped pieces, placed above each other, a ring of moldings being set between them. This makes the profile resemble an ancient bow or balista (q.v.), from which some derive the name; others derive it from Lat. *palus*, Eng. *pole* or pale.

BALUSTRADE, a range of balusters, together with the cornice or coping which they support. The B. is often used as a parapet for bridges, the roofs of large edifices, etc., or as a mere termination to the structure. It is also used to enclose stairs, altars, balconies, etc. Balustrades are made of stone, metal, or wood.

BALUZE, Étienne, 1630–1718; a French scholar; librarian for Colbert, the famous minister of state; in 1670, honored with the professorship of canon law in the royal college, the chair being founded expressly for him. On the fall of cardinal de Bouillon he lost his place, and was long kept out of Paris. His best known work is the *Capitularia Regum Francorum*.

BALZAC, Honoré de, one of the best of the modern French novelists, was b. on the 20th May, 1799, at Tours, where his father held a civil office. At the age of twelve, he entered the college of Vendôme, but finished his studies at the Pension Lepitre, in Paris. His father who had been impoverished by the loss of his situation, then placed him with a notary, to whom he acted as clerk. This occupation proving intolerably irksome, B. soon after began his literary career, and wrote about 30 volumes, under the name of St. Aubin, M. de Veillergré, St. Alme, etc. He received some trifling assistance in writing these novels, which were, however, so unsuccessful, that he lived in the greatest poverty. In the year 1826, he entered into partnership with the printer Barbier, and published various works; but the speculation turned out so ill, that he fell into debt, and returned once more to book-making. His perseverance was admirable. Although long

utterly unsuccessful, he continued to write on until at last he opened a path for himself by his novel *Les Derniers Chouans, ou la Bretagne en* 1800 (Par. 1829). In this book he abandoned for the first time the manner of Pigault and Lebrun, which he had hitherto adopted. Among his best works are the *Physiologie du Mariage* (2 vols. Par. 1831), *Scènes de la Vie Privée* (5 vols. 1831), *Scènes de la Vie de Province* (1832), *Scènes de la Vie Parisienne* (1832), *Le Médecin de Campagne*, *Le Père Goriot*, *La Peau de Chagrin*, *La Recherche de l'Absolu*, which were all received with much favor by the public. Of all his novels, two only can lay claim to anything like artistic completeness. They are the *Histoire Intellectuelle de Louis Lambert*, and *Eugène Grandet*. His other works suffer more or less from unnaturalness, diffuseness, and the want of a solid knowledge of the world, although there is a richness of description in portraying individual features of character, as drawn directly from the heart, not to be denied. B. exercises immense power over the female part of his readers. In his *Contes Drolatiques, colligez ès Abbaies de Touraine, et mis en lumière par le Sieur de Balzac pour l'esbattement de Pantagruelistes et non aultres* (2 vols. Par. 1833), he follows exactly in the footsteps of Rabelais. Success made B. conceitedly ambitious. He thought himself equal to the most distinguished authors of all time, and represented the aim of his literary activity to be, to give a complete picture of human life in all its varied phases. As a dramatic author he decidedly failed. He d. Aug., 1850. A collected edition of his works in 45 vols. was published in Paris, 1856–59. An English translation of his letters, with a memoir by his sister, was issued in 1878.

BALZAC, Jean Louis Guez de, b. at Angoulême in 1594. In his youth he was secretary to cardinal la Valette at Rome, where he cultivated his taste for elegant composition, and on his return to Paris devoted himself to the refinement of his native language. His efforts in this direction have given him a permanent place in the literature of his country; and though his writings do not possess much intrinsic worth, they heralded the splendid phalanx of genius which adorned the subsequent age of Louis XIV. He was a favorite of cardinal Richelieu, a member of the French academy, a councilor of state, and historiographer. His violent literary disputes with Father Goula caused him to leave Paris and retire to his hereditary property of Balzac, where he died on the 18th Feb., 1655. A collection of the works of B. appeared in Paris, edited by l'Abbé Cassaigne (2 vols. Par. 1665; 3 vols. Amst. 1684). Of all his works, his *Lettres* (3 vols. Par. 1806) have been most generally admired, and are still read. A selection from his writings was arranged by Malitourne (2 vols. Par. 1822). Compare Moreau de Mersan, *Pensées de B.* (Par. 1807).

BAMBA, a province in Congo on the w. coast of Africa, s. of the river Ambriz; abounding in gold, silver, copper, and salt. It is said to be fertile, and densely populated. The climate is good for that part of the continent.

BAMBARRA, one of the states of Sudan, western Africa, lying, so far as has been ascertained, between lat. 12° and 14′ n., long. 15° e., and 5° w., and occupying both sides of the Joliba or Niger, which flows through its center from s.w. to n.e. The principal towns of B. stand on the banks of this river. The mountains in which the Niger has its source divide it on the s. from Guinea; the Sahara desert bounds it on the n.; on the w., Senegambia; and on the e., some of its sister-states. In its general aspect, the country is said to bear a considerable resemblance to the agricultural districts of England; but in the w. there are low chains of granite hills, forming continuations of the highlands from which the Niger springs. The climate in some parts is intensely hot; in others, it is more temperate, but it is generally healthy. The rainy season lasts from June to November. The land is well watered and fertile. Double crops of corn, rice, maize, yams, etc., are raised annually without much labor.

The butter-tree, cotton-tree, oil-palm, baobab, and date, are among the most important indigenous growths. The manufacturing industry of B. is important; the women making a soft coarse cloth, much esteemed for its beautiful blue color, and the men articles in gold, iron, and ivory, in which a pretty extensive trade is carried on. The inhabitants, chiefly Mandingoes, are said to be superior to their neighbors in intelligence, and to be much sought after as warriors by the petty chiefs around them, who are at constant war with each other. They generally lend their assistance on condition of a certain payment. The upper classes profess Mohammedanism, but the lower are pagans. The introduction of the former religion has had at least one good effect. It has supplied the native dialect with a written speech through the use of Arabic letters. The chief domestic animals are horned cattle, goats, sheep, and fine horses. The wild animals are lions, leopards, elephants, wolves, panthers, etc.; and venomous reptiles, of which the natives are much afraid. Crocodiles are numerous in the rivers, which also abound with fish. The principal towns are Sego, Sansanding, Yamina, and Bammaku, which are all populous. The country has a nominal monarch, but it is in reality ruled by several chiefs.

BAMBERG, a city of Bavaria, in the district of upper Franconia, beautifully situated on the banks of the Regnitz, not far from its confluence with the Main, and in the midst of vineyards, orchards, and hop-gardens. B., which has considerably declined in importance since the reformation, is a city of considerable antiquity, having originated, it is said, with a colony of Saxons who settled here in 804. The most noteworthy of its public buildings is the cathedral, a magnificent edifice in the Byzantine style, founded

by the emperor Henry II. in 1004, and restored after fire in 1110. It contains, among other monuments, the elaborately carved tomb of the founder and his empress, Cunigunda. Attached to the cathedral is a library, with valuable missals and manuscripts and what is represented to be the prayer-book of Henry II. There are several other fine ecclesiastical structures of early date, and the old palace of the former prince-bishops of B. The ruins of the castle of Altenburg, originally the seat of the counts of Babenberg, and the scene of many important historical events, stand on an eminence about a mile and a half from the town. The educational institutions of B. are numerous. Pop. '75, 26,958, chiefly engaged in the manufacture of beer, which is famous throughout Germany, cotton, cloth, gloves, musical instruments, etc. A large export trade in licorice and garden-seeds is carried on.

BAMBI'NO, a term in art descriptive of the swaddled figure of the infant Saviour, which, surrounded by a halo, and watched over by angels, occasionally forms the subject of altar-pieces in Roman Catholic churches. The *Santissimo* B., in the church of Ara Cœli at Rome, is held in great veneration for its supposed miraculous power of curing the sick. It is carved in wood, painted, and richly decorated with jewels and precious stones. The carving is attributed to a Franciscan pilgrim, out of a tree that grew on mount Olivet, and the painting to St. Luke The festival of the B., which occurs at the Epiphany, is attended by great numbers of country people, and the B. is said to draw more in the shape of fees than the most successful medical practitioner in Rome.

BAMBOC'CIADES, in painting, are grotesque scenes from common or low life—such as country-fairs, penny-weddings, boors merry-making. The name is derived from Peter van Laar, a painter, who, on account of his personal deformity, was surnamed Bamboccio (cripple); but he was not the first painter of such scenes.

BAMBOO', *Bambusa*, a genus of grasses, of which most of the species attain a great size, many of them 20 or 30 ft., some 70 or 100 ft. in height. The species are numerous, and are found in tropical and subtropical regions, both of the eastern and western hemispheres. They are of great importance to the inhabitants of the countries in which they grow. All of them have a jointed subterranean root-stock (rhizome) which throws up 10 to 100 stems. These are generally straight and erect; although one large species (*B. agrestis*), common in dry mountainous situations in the s.e. of Asia, has crooked and sometimes creeping stems. The stems grow to their full height unbranched, but afterwards throw out straight horizontal branches, especially in their upper parts, forming a dense thicket; and many of them being strongly armed with spines, they are planted for defense, presenting a formidable barrier, even against regular troops. Some of the smaller kinds are often planted as hedges. The stems are jointed like those of other grasses, very hard, but light and elastic, hollow, containing only a light spongy pith, except at the joints or nodes, where they are divided by strong partitions. They are, therefore, readily converted into water vessels of various sorts; and when the partitions are removed, they are used as pipes for conveying water. They are also much employed for house-building, for bridges, etc. The smaller stems are converted into walking-sticks, and are imported into Europe under the name of B. cane, both for that purpose and to be employed in light wicker-work. In China, the interior portions of the stem are used for making paper. Some of the species grow to the height of only a few feet; and almost all of them are slender in proportion to their height, although *B. Guadua*, a native of New Granada and Quito, has a trunk 16 in. in diameter. The stems of different species vary also very much in the thickness of the woody part, and so in their adaptation to different purposes. The external covering of the stem is, in all the species, remarkably silicious; the stem of *B. tabacaria* is so hard that it strikes fire when the hatchet is applied. This species is a native of Amboyna and Java; its slender stems are polished, and used for the stalks of tobacco-pipes. The leaves of some kinds are used for thatch, and the Chinese plait hats of them; of the external membrane of the stems of some, they make paper. From the knots of the B. there exudes a saccharine juice, which dries upon exposure to the atmosphere, and which the Greeks called *Indian honey*. It is also sometimes named *Tabaris* or *Tabasheer;* but this name more properly belongs to a phosphorescent substance, containing silica and lime, and possessing remarkable properties, which forms in the joints of some species of B., and of other large grasses growing in dry situations. See TABASHEER.—The young shoots of some kinds of B. are eaten like asparagus, or are pickled in vinegar. Those of *B. Tulda*, a common Bengalese species, are used for these purposes when about 2 ft. long. The seeds of some species are used as rice, and for making a kind of beer. Bamboos are generally of very rapid growth, and they are often found in arid situations, which would otherwise be destitute of vegetation. It is not improbable that they may yet be employed, where they do not naturally abound, to render districts productive which are now little else than deserts, in climates like those of Arabia, the n. of Africa, and Australia; and the quality of the grain of different species seems to deserve more attention than it has ever received. The species common in the West Indies (*B. vulgaris*) is supposed to have been introduced from the East Indies. A few species are found in the Himalaya, to an altitude of 12,000 ft., and a dwarf species from that region has been successfully tried in the open air in England.

BAMBOROUGH CASTLE, on the site of which Agricola is said to have built a Roman fortress, is one of the oldest in Britain, having according to the Saxon chronicle, been erected by Ida, the first Saxon king of Northumbria, in 550. It appears to have been a royal residence for long after. In 642 it was unsuccessfully besieged by Penda, king of Mercia; and during the Danish descents on England it was twice partly demolished. Mowbray, earl of Northumberland, was besieged in B. in 1095 by William Rufus, and having fallen into the king's hands, lady Mowbray surrendered under the threat of his eyes being put out. When Northumberland was granted to Henry, son of David of Scotland, B. C. was reserved for the English crown, and here Baliol acknowledged Edward I.'s supremacy in 1296. During the wars of the Roses, it was the scene of several conflicts, and so battered and destroyed that it has not been again used as a fortress. In the time of queen Elizabeth, its governor was Sir John Foster, in whose family it continued till 1715, when it was bought, with the Forster estates, by lord Crewe, bishop of Durham, who left it with other property to trustees for benevolent purposes. The restoration of the castle, and its conversion to its present charitable uses, were chiefly carried out by one of these, the Rev. Dr. John Sharpe, who bequeathed his library to the institution. The income, which is about £9000, is expended in providing a market for the sale of provisions and groceries to the poor at prime cost; a dispensary for gratis advice and medicines to the sick; funds for maintaining, educating, and starting in life poor children of the district; lifeboats and apartments for shipwrecked sailors; a constant patrol during stormy nights for 8 m. along the coast; repairing churches, and aiding young men at the universities. B. village, near the castle, was a royal borough before the conquest, and in the time of Edward I. returned 2 members to parliament. Its pop. in 1871 was 320. Opposite B. C. are the Farne isles, where Grace Darling and her father saved the crew of the *Forfarshire* steamer in 1838.

BAMBOUK', a country of Senegambia, western Africa, lying in the angle formed by the Senegal and Faléme rivers. Its extent is roughly estimated at 140 m. in length, and from 80 to 100 in breadth. The climate is unhealthy, especially during the rainy season; but the valleys are remarkable for their fertility. Trees common to western Africa here attain enormous proportions. Vast herds of wild oxen roam the hills, and most of the wild animals of Africa abound. B. is chiefly remarkable for its gold, which the natives exchange for salt, cotton, and other manufactured goods. Its inhabitants, the Mandingoes, are professedly Mohammedans, but they cling to many pagan superstitions, and are very ferocious. B. was, four centuries ago, a short time in the possession of the Portuguese.

BAMIAN', a fruitful valley and pass of Afghanistan, about a mile in breadth, and inclosed by steep rocks, leading from Cabul to Turkestan. It is at an elevation of 8496 ft., and is the only known pass over the Hindu Kush for artillery and heavy transport. It was one of the chief centers of Buddhist worship, and with its two colossal statues was described by the Buddhist monks who visited India in the 4th and 5th centuries. The statues are found on a hill about 300 ft. high, in which are a multitude of cells excavated in the rock all round, and rising above one another in irregular tiers. The male figure is about 160 ft., the female, 120. Both are natural in attitude, and clothed in light drapery; the face of the former is the most perfectly preserved. Each figure is hewn out of a deep niche, also elaborately carved, and representing royal personages and a variety of symbols which resemble those on the coins of the Sassanidæ. Each contains a winding stair by which it is possible to ascend to the head. The whole valley is covered with the ruins of tombs, mosques, and other buildings, once belonging to the town of Ghulghuleh, which more recently occupied this site, and was destroyed by Genghis Khan in 1221. Eight m. eastward of B. lies the ancient fortress of Zohak, attributed to the fabulous Persian serpent-king of that name. The fortress is preserved for the purpose of guarding the important pass. Both there and in the valley of B., a grear number of coins, ornaments, and other antiquities have been recently found, and fully described by Masson, Wilson, Prinsep, Wood, and others.

BAMPTON, a small t. in the n.e. of Devonshire, chiefly on the left bank of the Batham, a tributary of the Exe, and 22 m. n. of Exeter. There are here extensive carboniferous limestone quarries. The manufacture of serge and pottery is carried on. St. Michael's church was built in the 14th c., and has a tower 70 ft. high. Pop. '71, 1111.

BAMPTON IN THE BUSH, a small t. in Oxfordshire, 14 m. s.w. of Oxford. It has an ancient cruciform church, with a large Norman tower, and examples of every period of the pointed Gothic style. Pop. '71, 764.

BAMPTON LECTURES. These lectures are so called after the name of their founder, the Rev. John Bampton, canon of Salisbury, who left estates originally worth £120 per annum, to the university of Oxford, for the endowment of eight divinity-lecture sermons, to be preached at Great St. Mary's every year, and to be published, at the expense of the estate, within two months of their being preached. The preacher is to lecture on one of the following subjects: "The Confirmation of the Christian Faith and the Confutation of all Heretics and Schismatics;" "The Divine Authority of the Scriptures;" "The Authority of the Primitive Fathers in Matters of Christian Faith and Practice;" "The Divinity of Christ;" "The Divinity of the Holy Ghost;" "The Apostles' and

Nicene Creeds." No person is qualified to preach these lectures who has not taken the degree of M.A., either at Oxford or Cambridge, and the same person shall never preach them twice. The first course was delivered in 1780. In 1834 and 1835, no lecturers were appointed, and no lecture was preached in 1841. With these exceptions, there has been an unbroken series of very valuable, but rather learned than popular discourses. The most remarkable are the following: Those delivered in 1784, on "Christianity and Mohammedanism," by Dr. White, who was accused of having obtained assistance in their composition from Dr. Parr and Dr. Badcock; those by Dr. Tatham in 1790, on "The Logic of Theology;" those of Dr. Nott in 1802, on "Religious Enthusiasm"—this series was directed against the pretensions of Wesley and Whitefield; those of Dr. Mant in 1812; those of Reginald Heber in 1815; Whately in 1822; Milman in 1827; Burton in 1829, on "The Heresies of the Apostolic Age;" Soames in 1830, on "The Doctrines of the Anglo-Saxon Church." But of the whole series, none have caused greater excitement and controversy than those delivered by Dr. Hampden in 1832, on "The Scholastic Philosophy considered in its Relation to Christian Theology." They were attacked on all sides, but especially by the leaders of the Oxford tract association. Hampden was accused of rationalism and Socinianism. When he was appointed regius professor of divinity in 1836, a petition against his appointment was sent up to the throne; and upon this being rejected, a censure was passed upon him in convocation by a large majority, declaring his teaching to be unsound, and releasing undergraduates from attendance at his lectures. Notwithstanding this, he was raised to the see of Hereford in 1847, under the government of lord John Russell—thirteen of the bench of bishops protesting against the appointment. The course of B. L. delivered by the late dean Mansel, in 1858, on "The Limits of Religious Thought," caused a less bitter, but scarcely less interesting controversy. Mr. Mansel possessed great power as a dialectician, and his lectures contained many very eloquent passages. The main position which he took up was, "That the human mind inevitably, and by virtue of its essential constitution, finds itself involved in self-contradictions whenever it ventures on certain courses of speculation," i.e., on speculations concerning the infinite nature of God. He maintained that all attempts to construct an objective or metaphysical theology must necessarily fail, and that the attainment of a philosophy of the Infinite is utterly impossible, under the existing laws of human thought—the practical aim of the whole course being to show the "right use of reason in religious questions." Mr. Mansel was accused by his critics of condemning *all* dogmatic theology (e.g., all creeds and articles), and of making revelation itself impossible. Mr. Maurice was one of his principal opponents. Canon Liddon's lectures in 1866, on "Our Lord's Divinity," have been the most important since dean Mansel's. The B. L. for 1874 were delivered by the Rev. Stanley Leathes, M.A., on "The Religion of the Christ; its Historic and Literary Development considered as an Evidence of its Origin."

A course of lectures similar to the Bampton was founded about the same time at Cambridge, by the Rev. John Hulse. See HULSEAN LECTURES.

BAMPU'RA, BHAMPURA, or BHANPURA, a town of Hindustan, in the territory of Indore, on the Rewa, 1344 ft. above the level of the sea, about 180 m. s.w. of Gwalior. It is situated at the base of a range of hills, is surrounded by a wall, and has an unfinished fort, built of stone, which incloses an unfinished palace. Both palace and fort were begun by Jeswunt Row Holkar, of whom there is a beautiful marble statue in the palace. B. is the principal place of a pergunnah containing 70 villages. Pop. 20,000.

BAN. This word occurs in most of the modern languages of Europe, and its primary signification appears to have been, "to make a signal" (see BANNER), "to proclaim" or "publish." This meaning it retains in the phrase, *bans* or *banns* (q.v.) of marriage. In Germany, the *acht* or *bannum* was a sentence of outlawry pronounced in the middle ages against those who escaped from justice, or refused to submit to trial. We often read of refractory princes, and even cities, being placed under the *ban of the empire*. The following are the terms of banning used in an old formula: "We declare thy wife a widow and thy children orphans; we restore all thy feudal tenures to the lord of the manor: thy private property we give to thy children; and we devote thy body and flesh to the beasts of the forest and fowls of the air. In all ways and in every place where others find peace and safety, thou shalt find none; and we banish thee into the four roads of the world—in the devil's name." Besides these sentences of outlawry, many other announcements were accompanied with denunciations and imprecations. When a grant of land was made for a religious purpose, or when a charter of liberties was granted, the transaction was proclaimed in public with certain ceremonies, and curses were denounced against any one who should violate the deed. Thus *banning*, or publishing, came to be associated with cursing; and hence the origin of the popular use of the word. It occurs in this sense in Shakespeare and Milton, and other old writers.

BAN, or BA'NUS, supposed by some to be a contraction of the Illyric word *bojan*, i.e., lord, but more probably another form of the Slavonic word *pan*, which possesses the same signification. Formerly, it was a title given to some of the military chiefs who guarded the eastern boundaries of the Hungarian kingdom, and was therefore synonymous with the German *markgraf*. The ban, who was appointed by the sovereign, but not for life, and whose appointment had to be ratified by the national diet, had originally very exten-

sive, in fact almost unlimited powers. In political, judicial, and military affairs, he was the supreme authority. Within his own territory, he exercised an influence similar to that of the palatine in Hungary, and only lower than a king. In time of war, he headed the troops of his *banat* (q.v.), and if the campaign occurred within its limits, it was his duty invariably to occupy the post of danger. He led the van to battle, or covered the rear in retreat. For these services, he was recompensed partly in ready money, and partly by a monopoly of salt. The most important banats were those of Dalmatia, Croatia, Slavonia, Bosnia, Machow, and Szorény, but their boundaries changed so frequently, that at the present day it is impossible to ascertain what they originally were. The encroachments of the Turks in the 16th c. rendered the union of the various banats necessary; and after some time, the whole were formed into the double banat of Dalmatia and Croatia. A still more complete unity was subsequently obtained by centralizing the military power. In 1723, the authority of the B. was made entirely subordinate to that of the supreme government of Hungary. After numerous vicissitudes, his powers, rights, and titles were strictly defined during the reign of Maria Theresa. He was then acknowledged to be the third dignitary of the Hungarian kingdom, appointed a member of the Hungarian council of government, and president of the council of the banat, and at the coronation of the Hungarian king went before him, bearing the golden apple, the symbol of sovereignty. Such was the position of the ban until the 4th of Mar., 1849, when Croatia, Slavonia, and Dalmatia were transformed into Austrian crownlands, and the ban made wholly independent of Hungary. In 1868, Croatia and Slavonia were reunited with Hungary. One of the Hungarian ministers superintends the affairs of the "kingdoms of Croatia and Slavonia;" while there is a special local administration for internal affairs. The head of this administration is called the ban.

BAN; ARRIÈRE BAN. Besides the civil use of the word ban, as a proclamation or prohibition, there was a military application of the term in former days in France. When the feudal barons, who held their estates and honors from the king, were summoned to attend him in the time of war, they were called the *ban*, or the levy first called out; while the tenants, subordinate to these barons, formed the *arrière ban*, or secondary levy.

BANANA, a fruit originally East Indian, but much cultivated in warm countries over the whole globe. It is now generally regarded as a mere variety of the plantain (q.v.); although they were formerly ranked by botanists as distinct species, the plantain under the name of *musa paradisaica*, and the B. of *M. sapientum*—the specific name signifying "of the wise men," and being intended to convey an allusion to a statement by Theophrastus concerning a fruit which served as food for the wise men of India, and which, from his description, is supposed to have been the plantain or banana. The names plantain and B. are somewhat vaguely used in their application to different cultivated varieties, which are very numerous; those called B. have generally dark purple stripes and spots on their stems, and the fruit is smaller, less curved, and of more delicate taste than the plantain, with a soft and luscious pulp. Each fruit is generally about four or five inches long. The B. is always used in a ripe state, and never, like the plantain, as a substitute for bread; unless when the pulp is squeezed through a fine sieve, and formed into small loaves, which, when dried, may be kept for a great length of time, but which are saccharine, and not farinaceous. It is sometimes fried in slices; it is often made into preserves; and its juice affords an excellent wine. It has been produced of good quality in hot-houses in Britain.—The fruit of *musa cavendishii* is sometimes also called banana. See PLANTAIN.

BANANA BIRD, *Xanthornus icterus*, a beautiful bird, allied to the Baltimore bird (q.v.), which it considerably exceeds in size; a native of the West Indies and warm parts of America. Its colors are tawny and black, with white bars upon the wings. It is very lively and active. It is gregarious, and a number of the nests may often be seen near each other, suspended to the extremities of slender branches of trees, so as to be out of the reach of snakes and monkeys. It is often kept in houses to destroy insects. It is very easily domesticated, and delights to be caressed.

BANANAL', also called Santa Anna, an island 200 m. long by 35 wide, in the Araguay river, Brazil; exceedingly productive of bananas, whence the name.

BA'NAS, or BUNAS, the name of three rivers of India.—1. A river of Rajpootana, rising on the western frontier of Mewar, in the Aravulli mountains, about n. lat. 24° 47', e. long. 73° 28'. Flowing through Mewar for 120 m., in a generally north-eastern direction, receiving the Beris, or Beruch, on the right, and the Botaseri on the left, it passes the town of Tonk, where it changes its course to the s.e., and falls into the Chumbul in n. lat. 25° 54', e. long. 76° 50', after a total course of 320 miles.—2. A river which also rises in the Aravulli mountains, and after a south-westward course of 180 m., is lost in the Runn of Cutch, terminating in a number of small and intricate channels.—3. A river of Rewah, in Bundelcund, having a north-westward course of about 70 m., and falling into the Sone near Rampur.

BA'NAT, any district or territory under a ban, but specially applied to a province of the Austrian empire, which has, curiously enough, *no* ban. It is bounded on the w. by the Theiss; on the s. by the Danube; on the e. by the line of mountains which sepa-

rates Hungary from Wallachia and Transylvania; and on the n. by the Maros. It consists of the three Comitate; Temesvár, Torontál, and Krassowa. Pop. '69, 1,028,263. It is partly mountainous and partly flat, but is everywhere copiously watered, and exceedingly fertile. The chief rivers are the Temes and Karasch. The climate is warm in summer, and comparatively cold in winter; but, though not unpleasant, it is far from salubrious in the w., on account of the swamps and morasses which abound. Nevertheless, it is the most productive of the Austrian provinces, yielding rich crops of wheat, spelt, and other grains; the vine is little cultivated. Wild-fowl are numerous, and the rivers swarm with fish. The mines are valuable; coal, iron, copper, gold, silver, and zinc being procured in considerable quantities. The mineral springs of Mehadia are in great repute. The principal town is Temesvár.

B. belongs to the Hungarian portion of the Austrian empire. It was formed into an Austrian crown-land in 1849, but was restored to Hungary in 1860.

BANAWARAM', a t. of India, in the territory of Mysore, in a fine open country, among the head-waters of the Hugri, 81 m. n.w. from Mysore. It is a town of some antiquity. It was taken in 1694, in a night-assault by Chika Deo, rajah of Mysore. When it had fallen under the dominion of Hyder Ali, the inhabitants were in great part removed to Nagapuri, a new town which Hyder had founded in the vicinity. Previous to this removal, the pop. was about 10,000. The new town proving extremely unhealthy, the survivors of the people of B. were permitted to return to their old habitations.

BANBRIDGE, a small t. in the w. of Down co., Ireland, on a steep slope on the left bank of the Bann, 76 m. n. of Dublin. It is a thriving seat of the linen manufacture in all its stages, from the preparation of the soil for the flaxseed to the finishing of the finest linen. Miles of bleaching-greens exist in the vicinity, and numerous factories along the Bann. Pop. '71, 5599.

BANBURY, a small t. in the n. of Oxfordshire, on the right bank of the Cherwell, 23 m. n. of Oxford. There formerly existed here a very strong castle, which was built about 1125, and sustained various sieges during the early English civil wars. At Danesmore, near B., the Yorkists were defeated in 1469. B. is the center of the famous rich red land of Oxford county. This land is among the most fertile in the kingdom. A system of canals connects the town with all parts of England. The vicinity of B. is thickly studded with villages. Numerous remains of the ancient Britons are found in the neighborhood. B. is noted for its manufacture of agricultural implements, and for its malt liquors, cheese, and cakes. There are also manufactures of plush, shag, girth, and other webbing. B. returns one member to parliament. Pop. (1871) of municipal borough, 4122; of parl. borough, 11,726.

BANC, legally, is a seat or bench of justice, and in this sense has given rise to the expression of the courts of law at Westminster "sitting in banc," or *in banco*—that is, sitting together on the bench of their respective courts, in term-time, and otherwise, as is provided by statute.

BANCA, an island n.e. of Sumatra, 1° 30′ to 3° 5′ s. lat., and 105° 10′ to 106° 53′ e. long., has an area of 6883 sq.m. Pop. '71, 153 Europeans and 41,748 natives and Chinese. Gold, iron ore, silver, lead, and amber are found, and the tin exported to Java for Holland averages 4200 tons. The sales in 1872 had a value of £533,137.

BANCO (It.), a commercial term meaning the standard money in which a bank keeps its accounts, as distinguished from the current money of the place. The distinction was more necessary when the currency consisted, as it often did, of clipped, worn, and foreign coins. These the early banks (Venice, Amsterdam, etc.) received at their intrinsic worth, and credited the depositor in their books with this bank value. The term was chiefly applied to the money in which the Hamburg bank kept its accounts, before the adoption of the new universal coinage of the German empire. It was not represented by any coinage. The Hamburg mark B. (= 1*s.* 5½*d.* sterling) was to the current mark (= 1*s.* 2½*d.*) as 20 to 16. Sweden had a peculiar bank money, 8 dollars B. being equal to 3 dollars specie. Genoa had at one time a bank standard, and the present current money being different from that, is still called "fuori banco," outside the bank.

BANCROFT, AARON, D.D., 1755–1839; b. Mass. He graduated at Harvard, and settled at Worcester, in 1785. He published, besides many sermons, an eulogy and a life of Washington, the latter reprinted in England. He was a strong opponent of Calvinism, before the Unitarians were known. Later in life he was president of the Unitarian association.

BANCROFT, EDWARD, 1744–1821; b. Mass.; practiced medicine in British Guiana, and resided several years in England. He was intimate with Franklin and Priestley. Among his works are *Essay on the Natural History of Guiana*, *Charles Wentworth*, a novel, and *Experimental Researches concerning Permanent Colors*.

BANCROFT, GEORGE, American historian, b. 3d Oct., 1800, near Worcester, in Mass., was the son of Dr. Aaron Bancroft, an eminent Unitarian minister. He entered Harvard college at the age of 13, and obtaining a valuable exhibition there, proceeded in 1818 to Göttingen, where he studied history and philology under Heeren, Plank, and

Eichhorn, and in 1820 obtained the degree of doctor. At Berlin, he attended the lectures of Hegel, and had frequent intercourse with Schleiermacher, W. von Humboldt, Savigny, Varnhagen von Ense, and other literary men of note. Subsequently, he traveled through Germany, and formed an acquaintance with Goethe and Schlosser. Having visited Paris, London, and Italy, B. returned to America, and after some time spent in tuition, devoted himself to politics. He soon became celebrated as a democratic politician, and was made collector of customs at Boston. He still continued his literary labors, especially in lectures upon German literature, philosophy, etc. When Polk was elected president, in 1845, he appointed B. secretary of the navy. While in this office, he established an observatory at Washington, and a naval school at Annapolis. In the autumn of 1846, B. was sent by Polk as ambassador extraordinary and plenipotentiary to England, where he remained till 1849, carefully collecting materials for a *History of America*. He published the result of his labors in his *History of the Revolution in North America* (Boston, 1852). He had already published his *History of the Colonization of the United States of North America* (3 vols., Boston, 1834–40). The whole of these writings are included in the author's *History of America*, a work of solid excellence, the 10th and last vol. of which appeared in 1874. In 1866, B. delivered an oration in honor of Abraham Lincoln. From 1867 to 1874, he was minister plenipotentiary at the court of Berlin. For some years he was a principal contributor to the *North American Review*.

BANCROFT, RICHARD, Archbishop of Canterbury, and a bitter opponent of the Puritans, son of John B. and Mary, niece of Hugh Curwyn, archbishop of Dublin, was b. at Farnworth, Lancashire, in Sept., 1544. Educated at Cambridge, he took the degree of B.A. at Christ's college, in 1567, and that of M.A. at Jesus' college, in 1570. He became rector of Teversham, Cambridgeshire, in 1575, of St. Andrews, Holborn, in 1584, and treasurer of St. Paul's cathedral in 1585. In the latter year he was admitted D.D. By the lord chancellor, Hatton, to whom he was chaplain, he was presented to the rectory of Cottingham, Northamptonshire. In 1589, he became a prebendary of St. Paul's, in 1592, of Westminster, and in 1594, of Canterbury. Consecrated bishop of London, May 8, 1597, he attended queen Elizabeth during her last illness. At the famous Hampton court conference under James I., he was one of the chief commissioners on behalf of the church of England, and took the lead in the disputations. In the convocation of 1603–4, he sat as president. In Oct., 1604, he succeeded Whitgift as archbishop of Canterbury; and was sworn in one of his majesty's privy council in Sept., 1605, and chancellor of the university of Oxford, 1608. He d. Nov. 2, 1610. B. had a high character as a preacher and statesman; and was a vigilant ruler of the church. He is author of two sermons, one of which, preached at St. Paul's, in 1588, contains a furious invective against the Puritans, and of two treatises respecting church order and discipline. B. left his library to his successors in the see of Canterbury forever.—His nephew, JOHN B., bishop of Oxford, 1632, d. 1640, built the palace of Cuddesden for the bishops of that see. Burned by the parliament troops, 1644, it was rebuilt, 1679.

BAND, in architecture, is the name given to any kind of ornament which is continued horizontally along a wall, or by which a building is encircled. Bands often consist of foliage, quatrefoils, or of simple bricks. *B. of a shaft* is the molding or suits of moldings by which the pillars and shafts are encircled in Gothic architecture. Several bands are often placed at equal distances on the body of the shaft when it is long, in which case they are known as shaft-rings.

BAND, or BANDS, a portion of clerical dress, and the only relic of the ancient *amice*, a linen vestment which was used in the ancient church to cover the shoulders and neck of the priest. It also forms a part of the full dress of the bar, the universities, and the leading functionaries in schools of old foundation. At Winchester and some other schools, it is even worn by the scholars themselves. The bands worn by lawyers and other civilians may be a relic of the wide stiff collar which was a part of the ordinary civilian dress in the reign of James I.

BAN'DA, chief t. of a district in Bundelcund, in lat. 25° 28′ n., and long. 80° 23′ e. In 1872, its pop. was 27,573. It is a great mart for cotton. It is situated on the right bank of the Cane or Keyn, an affluent of the Jumna, being 95 m. to the s.w. of Allahabad, 560 to the n.w. of Calcutta, and 190 to the s.e. of Agra. The district of B. contains 3030 sq.m., and (1872) 692,909 inhabitants.

BANDAGES are used by surgeons to apply pressure on a part, or to retain dressings upon wounds. The most common bandage is a strip of linen, calico, or elastic web, from 3 to 5 or more inches in breadth, rolled longitudinally; hence the name *roller*. There are also B. to suit special purposes, as the four-tailed for the head or knee, which consists of a piece of cloth split up on each side towards and nearly to the center. When applied, the tails are crossed and tied so as to make an extemporaneous night-cap. In applying the roller bandage to a leg, the surgeon first turns it round the foot, then round the ankle; and so by repeated turns, each one of which should overlap about a third of the previous one, till he reaches the calf of the leg, when he must fold at each turn the bandage sharply back on itself, by which maneuver the bandage will lie flat and smooth on the limb. The operator must remember that the bandage must be applied more tightly at the foot than in the leg, so that it may not impede the course of

the blood through the veins. This requires to be practiced, as the effect of a bandage is always for good or evil as it is well or ill applied.

BANDA ISLES, a portion of the Moluccas, consisting of 12 islands, 6 of which are uninhabited, about 50 m. to the s. of Ceram. Pop. (1870) of Banda and Amboyna, 236,737; of the former alone, probably about 110,000. Their mean lat. and long. respectively are 4° 30′ s., and 129° 50′ e. Their chief production is the nutmeg, the annual export of that spice being about 1,000,000 lbs., with a corresponding quantity—about one third—of mace. Like most of the islands in this neighborhood, they belong to the Dutch. They are lofty and volcanic.

BANDAJAN′, a pass over the Himalaya, forming the southern boundary of Kunawar. It is amidst mountains of gneiss, and is covered with perpetual snow. The summit of the pass is 14,854 ft. above the sea, and is in n. lat. 31° 22′, e. long. 78° 4′.

BANDAN′A, a kind of printed handkerchief of Indian origin, now extensively made in Britain, usually of cotton. The cloth is first dyed Turkey red, and then the pattern is made by discharging the color with bleaching liquor in a powerful Bramah press. The pattern to be discharged is cut out on two plates of such metal (lead) as may not be acted on by the liquor, and of the full size of the handkerchief. A dozen or more are put in at once between the plates, and so many of these courses are entered together as fill the press, when the pressure is applied, and the liquor is run in on the uppermost plate, which is grooved on the upper side to receive it, and holed to pass it from plate to plate through all the cloth-folds in the press. The pressure on the cloth to make clean work by preventing the spreading of the liquor, is enormous. The patterns in the real B. style of printing are spots and diamond prints, the best suited for discharging, and even for these a pressure of 500 tons is required to work them clean. See CALICO PRINTING.

BANDA ORIENTAL, a state of South America. See URUGUAY.

BANDAR′RA, GONZALO ANNES, d. 1556; called the "Portuguese Nostradamus." He was a shoemaker, composed religious verses, and pretended to give prophecies. Several works purporting to be his were issued, but probably all were written by others. Their burden was the resurrection and restoration of John IV., or of Sebastian, kings of Portugal.

BAN′DEL, ERNST VON, an eminent modern sculptor, was b. in 1800, in Anspach. While attending the academy at Munich, he prosecuted his studies so diligently that in 1820 he sent to the exhibition a plaster figure of Mars reposing, as large as life, which procured for him considerable reputation. Of various models of this kind done by him, one, a figure of Charity, was executed in marble. This work occupied the artist about ten years. It exhibits great chasteness of design, and a minute carefulness of execution. Among his best portrait busts, in which he excels, are those of Maximilian, king of Bavaria (1832), and of the artists D. Quaglio and Peter Hess. In 1834, he removed to Berlin, where his chief works were a colossal statue of Hermann (q.v.), the foundations of which were laid in 1841, but which was not inaugurated till 1875; a life-size statue of Christ; a life-size statue of Hermann's wife; and a bust of the poet Grabbe. For Hanover, where he has chiefly resided of late years, he has executed the statues of Shakespeare and Goldoni for the theater, and other works. For Göttingen, he executed a statue of William IV.

BANDEL′LO, MATTEO, an Italian writer of *novelle* or tales, was born at Castelnuovo in Piedmont about the year 1480. In early life, he became a Dominican monk, in the convent delle Grazie at Milan, but soon abandoned this vocation for a more free and independent life. His uncle, who had been elected general of the order in 1501, took him to travel with him; and in Rome and Naples, B. devoted himself to the study of belles-lettres. He then returned to Milan, whence he was driven by the Spaniards, as a partisan of France, after the battle of Pavia in 1525. He accompanied Francis I. to France, and was, in 1550, made bishop of Agen by Henry II. He left the care of his diocese to the bishop of Grasse, in order to be able to devote himself without disturbance to the completion of his tales, which he published in the Italian language in three volumes (Lucca, 1554), to which a fourth was added after his death, which took place in 1561. The tales of B. rank next to those of Boccaccio in Italy. They are distinguished by unaffected simplicity of style, fluency and vividness of narrative, and a harmonious brevity of periods. It must be confessed, however, that they are not unfrequently very impure in tone. B. wrote several other works.

BANDE NOIRE ("black band") was the name given, during the first French revolution, to the societies of capitalists who bought the confiscated buildings which had belonged to the church, emigrants, etc. The opprobrious name was fixed on them on account of their vandalism in the destruction of old relics, works of art, churches, convents, abbeys, episcopal residences, etc., many of which possessed both a scientific and historical interest. It has, however, been alleged, on the other hand, that these societies have frequently done considerable service to the community, in removing old and useless edifices, and that their minute subdivision into lots of the old territorial domains, has both favored agriculture and ameliorated the condition of the people.

BANDE'RA, a co. in s.w. Texas, on the Medina; 938 sq.m; pop. '80, 2,153—31 colored. It is a stock-raising region. Co. seat, Bandera City.

BANDEROLE, a small streamer fixed immediately under the crook, on the top of the staff of a crozier (q.v.), and folding over the staff.—Also an architectural term for the flat inscribed band used in the renaissance buildings, similar to those now used for mottoes to coats-of-arms.

BANDETTI'NI, TERESA, 1763–1837; an Italian poetess, who gained celebrity as an improvisatrice. She was much honored, not only for talent, but for virtues and accomplishments. Among her works are *Rime diverse*, *Da Morte d'Adone*, and *Il Polidoro*. She wedded Signor Pietro Landucci, a gentleman of Lucca.

BAND-FISH, or SNAKE-FISH, *Cepola*, a genus of fishes of the ribbon-fish (q.v.) family. The body is much elongated and compressed. The bones are little more solid than a mere fibrous net-work, and everything else exhibits a corresponding delicacy, so that specimens are seldom to be obtained in an uninjured state. All the species inhabit quiet depths, and are incapable of contending with waves and currents. Their singular form, and the beauty of their colors, make them objects of great interest. One species, the red B. (*C. rubescens*), not uncommon in the Mediterranean, is occasionally cast ashore by storms on the British coasts. It is about 15 in. long. Its brilliant appearance, when seen moving in the water, has suggested the names of fire-flame and red-ribbon, by which it is known at Nice.

BANDICOOT, *Perameles*, a genus of marsupial (q.v.) quadrupeds, occupying in the zoology of Australia a place somewhat analogous to that of shrews (q.v.) in Europe. Their dentition is remarkable, as they have ten cutting teeth in the upper jaw, and only six in the lower, the posterior ones of which are two-lobed: in other respects it nearly resembles that of opossums. They have an elongated head and pointed muzzle; the hind-legs are considerably longer than the fore-legs. The thumb and little toe of the fore-feet are little more than simple tubercles, so that there seem to be only three toes; and there is a fleshy tubercle in place of a thumb on the hind-feet. Their movements are similar to those of hares or rabbits. They live on bulbs, insects, etc., make ravages in potato-fields, and devour corn in granaries. There are several species. The long-nosed B. (*P. nasuta*) is about a foot and a half in length from the extremity of the nose to the origin of the tail, which is not unlike that of a large rat, but better covered with hair. It is chiefly found in the mountainous parts of New South Wales. *P. gunnii* is common in Van Dieman's Land.

BANDICOOT, BANDICOOT RAT, MALABAR RAT, or PIG-RAT, *Mus giganteus*, the largest known species of rat. The name B. is a corruption of the Telinga *pandikoku*, literally signifying pig-rat. The animal inhabits many parts of India, and is plentiful in Ceylon. It is chiefly found in dry situations, and often in hilly districts. It attains the weight of 2 or 3 lbs., and is 24 to 30 in. long, including the tail, which at the base is 2¼ in. in circumference. The body is thick, and greatly arched, black above, grayish below. Its flesh is a favorite article of food with the coolies of India, and is said to be delicate, and much to resemble young pork. It feeds chiefly on grain and roots, and is very destructive in gardens. "Its nests, when rifled, are frequently found to contain considerable quantities of rice, stored up against the dry season."—Sir J. E. Tennent's *Ceylon*.

BANDIE'RA, ATTILIO and EMILIO, two brothers well known for their tragic fate, were descended from a distinguished aristocratic family of Venice, which had once held a place in the red book of the republic. They were lieutenants in the Austrian navy, their father being rear-admiral; but, instead of sharing the pro-Austrian sentiments of their parent, they cherished enthusiastic dreams of the free and united republic of Italy. In the year 1842, they entered into correspondence with Mazzini, whom they regarded as almost a demi-god. Their glowing and enthusiastic patriotism breathes in every line of their letters. Both were noble spirits, ready for any sacrifice, but unfortunately impressed with the delusive idea that their native country could be saved by means of a conspiracy. Emilio, the younger, of a stronger bodily frame, but of a lighter disposition, was under the influence of his graver and more thoughtful brother. In the year 1843, they believed that the time was come for a revolution by force of arms; but their premature appeal finding no practical response, they fled to Corfu in Mar., 1844, where they endured many bitter disappointments and much misery. Hope alone inspired them with life; but at length, misled by false rumors of a rising in Naples, with which it is supposed the Neapolitan police had something to do, they ventured to land with twenty companions at the mouth of the small rive Nieto, in Calabria, believing that their appearance would be the signal for a general insurrection. The Neapolitan government expected them; one of their companions, a certain Boccheciampe, had betrayed them. They were attacked by an overwhelming force, and were nearly all taken prisoners at once. One only fell on the spot, and two escaped. Nothing was ever allowed to transpire respecting the trial of these unfortunate men. Attilio and Emilio were shot along with seven of their comrades in the public square of Cosenza, on the 25th July, 1844. They died joyfully, exclaiming "Viva l'Italia!" The public mind had not then become accustomed to hear of bloody deaths for political causes. A cry of indignation resounded through Europe at this "kingly revenge," as it was called in a conservative paper of the day. A

year later, their remaining companions were pardoned. The fate of the brothers B. attracted much attention in England, from the circumstance that letters of M. Mazzini, then in London, had been opened in the post-office by authority of government, which was accused of giving such information to the Italian governments as enabled them to entrap the insurgents.

BANDINEL'LI, Baccio, the son of a famous goldsmith of Florence, and one of the best sculptors of his time, was b. at Florence in 1487. His first instructions were probably received in the workshop of his father, for in those days goldsmiths wrought from their own designs. He was afterwards a pupil of Rustici, and the friend of Leonardo da Vinci. He was an angry and jealous rival of Michael Angelo, whose grandeur of conception he strove to equal, and who is said to have retaliated his enmity by contempt. It must be admitted, however, that we have only prejudiced sources from which to draw our information regarding him. Benvenuto Cellini, whose language is generally passionate and hyperbolical, is his chief accuser, although Vasari also speaks of his proud and envious disposition. Whatever may have been his moral infirmities, it is impossible to deny that as a sculptor he was in his day second only to Michael Angelo. His feuds with his brother-artists do not appear to have injured him in the opinions of persons of distinction. He was patronized by Cosmo de' Medici, Charles V., Francis I., Clement VII., and other powerful friends. Clement even bestowed on him an estate. He died at Florence, 1559–60.

His best works are bassi-rilievi, among which are those that adorn the choir of the duomo at Florence. On the high-altar in the same building is to be seen his corpse of Christ, supported by an angel, with God the Father over it. His most ambitious work is Hercules with Cacus at his feet. In the Medicean gallery are his copies of the group of the Laocoon—a masterly imitation of the antique, in which he boasted that he excelled even the ancients themselves. He also executed statues of some of his patrons; all his works exhibit power, vigor, and skillful drawing, but it is alleged, apparently with considerable truth, that "he was too fond of the terrible graces of composition."

BANDIT, a word originally signifying a "banished" or outlawed person; then one who, because outlawed, wages war against civilized society; and finally a highway robber. The banditi, or banditti, formed in Italy in earlier times, as it were, a separate community or guild, who submitted to their own stringent laws, carried on both open and secret war with civilized society, and kept up a certain romantic idea of honor. By means of the severe measures which were adopted in 1820 by the papal government against the banditti and their abettors, their haunts were broken up. Those who still occasionally disquiet the frontiers of Naples are in general people settled on the spot, who regard robbery and murder as equally a branch of their trade with agriculture. Peter the Calabrian, one of the most famous B. chiefs in 1812, assumed the titles of "emperor of the mountains, king of the woods, and lord of the highroads from Florence to Naples." The government of Ferdinand I. found themselves obliged to conclude treaties with them. The banditti must be distinguished from common robbers, who were called *malviventi*. In later times, the banditti were joined by adventurers of all kinds, to such an extent, that the Austrian troops who occupied Naples were obliged to make frequent expeditions against them. In Sicily, the banditti are most numerous in the Val Demone. They formerly acquired so much power there, that the prince of Villafranca, as a piece of policy, declared himself their patron, and treated them with much confidence. In the years 1841–43, political fugitives united with robbers and adventurers of all kinds in the Abruzzi, Calabria, and Romagna, and since then they have never been entirely extirpated. The revolution of 1848–49 added greatly to their numbers, and in several districts of Italy, especially in the states of the church, between Ferrara and Ancona, they reached an unheard of degree of boldness, notwithstanding the Austrian army of occupation. Under the command of one Bellino (known by the name of "Il Passatore"), a daring and talented man, who died in Mar. 1851, they kept the country in terror, and even burned several villages to the ground. They also carried on a real guerrilla warfare against the military forces of the country. Recent events in Italy, have, it is said, recalled numbers of these banditti to a more honorable life. See Camorra.

BANDOLEER', or Bandaleer'. Two centuries ago, soldiers' muskets were provided with *matchlocks*, a very slow and ineffective contrivance for firing. The musketeers were furnished with gunpowder in small cylindrical boxes made of wood, tin, or leather, each containing sufficient for one charge. Twelve of these little boxes were fixed to a belt called a *bandoleer*, worn over the left shoulder. In what way these were superseded by a superior arrangement, will be found noticed under Cartridge.

BANDOLINE is a mucilaginous substance used for stiffening hair, and keeping it in shape or form. It is much used by ladies in the present prevailing mode of wearing the hair, and by gentlemen, to dress their moustaches. The usual receipt for making the B. sold in the shops is to boil carrageen (q.v.) or Irish-moss with water till a thick mucilage is obtained, which is afterwards scented with *Eau de Cologne* or other perfumed spirit; a second mode of preparing B. is to soak quince-seeds in cold water for a day or two, then strain, and add perfume; and a third process is to heat gum tragacanth with water, and when a mucilage is obtained, add the scent.

BANDON, or BANDONBRIDGE, a t. of the co. of Cork, Ireland, on the Bandon, 12 m. s.w. from Cork, with which it is connected by a railway. The houses are built of stone. There are several good streets and numerous ecclesiastical and other public buildings. B. was originally peopled by a colony of English Protestants and was so strictly Protestant that, till about the beginning of the present c., no Roman Catholic would have been allowed to settle in it. More than three fourths of the population are now Roman Catholics and there is a Roman Catholic convent. B. was at one time a prosperous manufacturing t., cotton-spinning and weaving being extensively carried on; but these branches of industry have been almost entirely relinquished, and the pop., which was 9049 in 1841, had diminished to 6131 in 1871. It returns one member to the house of commons. The country around B. is very beautiful, well wooded, undulating, and pastoral. The river Bandon rises in the Carberry mountains and its mouth forms the harbor of Kinsale. Spenser describes it as "the pleasant Bandon, crowned by many a wood." It has a course of 40 m., for 15 of which it is navigable to Innishannon, 4 m. below B.

BANDONG, a commercial t. on the w. coast of Java, in the vicinity of the volcano Gunong Guntour, by an eruption of which 80 villages were destroyed in 1822.

BANDS, MILITARY, consist each of a body of skilled musicians, attached to a regiment in the British service. According to military regulations, the only indispensable instruments are drums, fifes, bugles, and trumpets, all of which are employed to give signals on the march or in active service, either for infantry or for cavalry. To supplement this meager musical establishment, however, the officers of regiments organize, chiefly at their own cost, effective military bands, who use a variety of instruments—such as flutes, clarionets, bassoons, horns, ophicleides, big drums, cymbals, triangles, etc. This arrangement has assumed almost the force of a regulation; for officers above the rank of subaltern are obliged to contribute a sum not exceeding 12 days' pay in the course of a year and an extra sum when promoted to the band-fund. The members of these bands are selected from the ranks; but the band-master, though in uniform, is often a civilian who is hired for the purpose and who generally refuses to accompany the regiment abroad, except at an increased rate of remuneration. The musicians, generally, are in an anomalous position; for, whilst serving in the band, their pay and eventually their pensions are restricted to those of the private soldier. Good musicians have at all times a tendency to quit the B.; their better prospects as teachers and players in orchestras and concerts induce them to obtain release by paying the amount of compensation prescribed by regulation. An attempt made by the duke of Cambridge in 1856 to relieve the commissoned officers of part of the expense entailed upon them by the present system failed, except as regards subalterns, and with that exception matters remained as they were. In most of the regiments of the line the band consists of a band-master and about 15 musicians; but in the choice corps the number is often much larger. The band plays on parade and at mess as a part of regular duty. When M. B. play at festivals, concerts, etc., "by permission of the commanding officer," the payment goes to the musicians; and the chance of obtaining these fees is one of the inducements to the men to remain in a service which has very few attractions in relation to the actual regular amount of pay. The bands of the 3 regiments of foot-guards—Grenadier, Coldstream, and Scots Fusilier—are very frequently engaged in this way during the London season.

BANEBERRY. See ACTÆA.

BANER, JOHAN, 1595–1641; a Swedish general under Gustavus Adolphus in the 30 years' war, commanding the right wing in the battle of Leipsic and defeating Pappenheim. After the death of Gustavus the regent Oxenstiern made B. chief of the army. He was victorious at Wittstock and at Chemnitz and overran all Germany, where he was accused of unnecessary harshness. He failed in an attempt in 1641 to capture the emperor at Ratisbon and died soon afterwards. He had few equals in reckless gallantry.

BANFF (pron. Bamf), the capital of Banffshire, a seaport in the n. of the co., on the left bank of the mouth of the Doveran, 45 m. by road, and 50 by rail, n.n.w. of Aberdeen. It forms a higher or inland town, and a lower or sea town, on the Moray Firth. On a height between the towns are some remains of a royal castle, on the site of which is now a large house—the "castle." To the e. of B. is Duff house, the seat of the earl of Fife, with a large park. The harbor is liable to be sanded up. A seven-arched bridge over the Doveran unites B. with the seaport of Macduff, half a mile to the east. The chief exports are corn, cattle, salmon, and herrings. In 1872, 429 vessels of 70,386 tons, entered the port. Pop. '71, 7439 in B., and 3407 in Macduff. In 1877–78, the valued rental of B. was £10,699. B. with Elgin, Cullen, Inverury, Kintore, and Peterhead, sends one member to parliament. Robert II., in 1372, made B. a royal burgh. Archbishop Sharp of St. Andrews was born here in 1613. Macpherson, a noted robber, was executed here in 1700. Some houses and much property in B. were destroyed by the Aug. flood in the Doveran in 1829.

BANFFSHIRE, a co. in the n.e. of Scotland, bounded n. by the Moray Firth; e., s.e., and s. by Aberdeenshire; w., by Elgin and Inverness shires. It stands 13th among the Scotch counties in size, and 14th in population. Its greatest length is about 68 m., its

greatest breadth about 32—average 12; its extent of sea-coast about 30; estimated area, 686 sq. miles. The surface, especially in the s. and s.e., is mountainous, interspersed with fertile valleys and fine pastures; but the surface near the coast is comparatively level. The chief mountain-ranges, rivers, and strike of the stratified rocks, run from s.w. to n.e., and the whole co. is an extensive slope in the same direction, from the Grampians to the Moray Firth, into which the rivers flow. The coast is rocky, but not high, except to the e. of Banff. The highest peaks are the North Cairngorm, 4083 ft.; Ben-a-main, 3874; Ben Rinnes, 2763; Corryhabbie, 2569; Knock, 1416. Ben Macdhui, 4295 ft., is partly in Banffshire. The chief rivers are the Spey, which bounds a third of the co. on the w.; and the Doveran, 60 m. long, and mostly included within the county. The predominant rocks are granite, quartz rock, mica-slate, clay-slate, syenitic greenstone, graywacke, graywacke-slate, old red sandstone with fossil fishes, metamorphic limestone, and serpentine. The serpentine near Portsoy has long been famous as the "Portsoy marble." Beryl and rock-crystal occur on Cairngorm. Lead, iron, antimony, and plumbago occur in small quantity. The soil in many parts is very fertile and highly cultivated. In 1878, a third of the surface of B. was in crop, the chief crops being oats, turnips, and grass. The breeding of cattle is the chief object of the farmer. In 1878, B. had 7797 horses, 43,702 cattle, 51,905 sheep, and 3496 pigs. The chief manufactures of B. are weaving, bleaching, tanning, distilling, and artificial manures. Glenlivet whisky has long been celebrated. The chief exports are grain, meal, and cattle. There are 12 fishing towns and villages along the coast. The herring-fishery is extensively carried on. The salmon-fisheries of the Spey and Doveran are very valuable, the Spey ranking after the Tweed and Tay as a salmon-river. B. is divided into the districts of Enzie, Boyne, Strathisla, Strathdoveran, Balveny, Glenlivet, and Strathavon. The chief towns and villages are Banff, Macduff, Portsoy, Keith, Cullen, Buckie, Dufftown, and Tomantoul. Pop. in '71, 62,023; with 107.7 females to every 100 males; 84.79 per cent of the children between the ages of 5 and 13 were receiving education. There are 23 civil parishes in the co., and 81 places of worship (of which 33 belong to the established church, and 24 to the free church). Valued rental of B. (1878–79), £221,123. The parliamentary constituency in 1878–79 was 2552. B., along with the counties of Aberdeen and Elgin, enjoys the Dick bequest (q.v.) for parochial education. Two thirds of B. belong to 4 landed proprietors. The co. returns one member to parliament, and Banff and Cullen unite with Elgin, Inverury, Kintore, and Peterhead in returning another. B. contains numerous remains of antiquity, the most remarkable being the old churches of Gamrie and Mortlach. The former built in 1010, and used for public worship till 1830, is called the "Kirk of Skulls," the bones of the Norsemen who fell on the neighboring field of Bloody Pots having been built into its walls. Mortlach was for a c. the seat of a bishop, but David I., in 1139, incorporated the see with that of Aberdeen.

BANGALORE, a fortified t. of Mysore, in a district of the same name, situated 70 m. n.e. of Seringapatam, in lat. 12° 58′ n., and long. 77° 38′ east. It is the chief military station of the British in the territory. In has a manufacture of silk; but that of cotton, is, or has been, far more important, having been at one time estimated to employ 3000 looms. The pop. of B. was (1872) 142,513. As the place is 3000 ft. above the sea, the thermometer, during six successive years, is said to have risen only twice above 90°, and then only to 92° and 93°. During the same period, the lowest temperature was 61°. B. was a favorite residence of Hyder Ali; and, in 1791, it was stormed by the British under lord Cornwallis. Water is good and abundant; and European vegetables grow in the gardens.—The district of B. has an area of 2914 sq.m. and a pop. of (1871) 828,354.

BANGKOK', the capital city of Siam, is situated on the banks of the Meinam, about 20 m. from the mouth of that river, in the gulf of Siam, and in lat. 13° 38′ n., and long. 100° 34′ e. The population is about 500,000, about half of whom are Chinese, in whose hands is centered nearly all the trade of B., which is large, as is shown by the commercial returns. The exports in 1871 were $6,132,913; in 1872, $6,684,390. The imports in 1871 amounted to $4,509,461; in 1872, to $5,247,729. For their right to trade here, the Chinese pay a poll-tax of about $3 on entering the kingdom, and a similar sum is collected from them every three years. The payment of this tax exempts them from the half-yearly servitude which all other oriental strangers resident in Siam are required to give. The approach to B. by the Meinam, which can be navigated by ships of from 200 to 300 tons burden, is exceedingly beautiful, the banks being skirted by fine trees full of gay birds. As the town is neared, numerous temples present themselves, and floating-houses become common; and finally, the whole city, with its rich gardens, and shining temples and palaces, bursts full upon the view. A large number of the houses float on rafts, and can be transferred from one place to another at pleasure. There are a few houses in the city built of brick and stone, but the greater part are of wood. There are usually in each house a division for males and one for females. The land-houses are raised upon piles, 6 or 8 ft. from the ground, and are reached by rude ladders—the daily flow of the tides and the annual inundations rendering this plan necessary. The floating-houses are made of bamboo-boards, wicker-work, or palm-leaves, and have generally a veranda in front, with a small wing at each end. The circumference of the walls of B., which are 15 ft. high and 12 broad, is said to be 6 miles. The internal traffic of B. is

chiefly carried on by means of canals, there being only a few passable streets in the whole city. Horses and carriages are rarely seen except in the neighborhood of the palaces. The chief interest of the kingdom of Siam, according to sir John Bowring, concentrates itself in Bangkok. B. is the constant residence of the two kings of Siam and their respective courts. The palace of the first king is surrounded by high walls, and is nearly a mile in circumference. It includes temples, public offices, accommodation for some thousands of soldiers, with their necessary equipments, a theater, and rooms for about 3000 females, 600 of whom are the wives of the king. The sacred white elephant has also a place within the palace. Throughout the interior are distributed the most costly articles in gold, silver, and precious stones. The palace of the second king, whose functions are not very clearly defined, is nearly as large as that of the first king, but not so ostentatious. See SIAM. The temples of B. are innumerable, and decorated in the most gorgeous style, the Siamese taking a pride in lavishing their wealth on them. Some of them, according to the Catholic bishop Pallegoix, have cost more than 4,000,000 francs (£160,000). In the neighborhood of B. are iron-mines and forests of teak-wood. The chief exports are sugar, pepper, cardamoms, ivory, feathers, hides, fine woods, rice, salt, and fish. By the treaty concluded by sir John Bowring in 1855, the Siamese reserve the right to prohibit the exportation of salt, rice, and fish, in cases of threatened scarcity. The imports are tea, manufactured silks and piece-goods, opium, hardware, machinery, and glass wares. In 1872, 336 vessels of 132,012 tons entered, and 294 of 136,148 tons, cleared the port. See sir John Bowring's *Siam*.

BANGOR, an episcopal city, borough, and seaport t. in the n.w. of Caernarvonshire, North Wales, on the s.e. bank of the Menai strait, 2½ m. from the Britannia bridge, and 59½ w. of Chester. It consists chiefly of a narrow crooked street, a mile long, stretching s.w. through a narrow fertile valley, bounded on the s. by steep precipices. The grandeur and beauty of the surrounding scenery has long made it a favorite resort, and the opening of the Chester and Holyhead railway, on the great line of communication from London to Dublin, has greatly promoted its prosperity. The town has of late years been greatly improved, and mostly rebuilt. Its chief trade is derived from the great slate-quarries of Llandegai, 6 m. distant, and employing 2000 men. The slates are exported to all parts of the world, and also manufactured at B. into tables, chimney-pieces, etc. Pop. '71, 9859. B. unites with Caernarvon, Conway, Criccieth, Nevin, and Pwllheli, in sending one member to parliament. B. is a place of great antiquity. In 525, St. Deiniol founded a college here. It was raised to a bishopric in 550, the founder being the first diocesan. The cathedral founded by him was destroyed by the Saxons in 1071, rebuilt in 1102, and again destroyed by fire in 1402. The present edifice, built between 1496 and 1532, is a plain embattled cruciform structure, 214 by 60 ft., with a pinnacled tower 60 ft. high. Several Welsh princes and distinguished ecclesiastics are buried here. B. bishopric is the oldest in Wales.

BANGOR, a small seaport t. in the n.e. of the co. of Down, Ireland, on the s. side of the entrance to Belfast lough, and 12 m. e.n.e. of Belfast, with which it is connected by rail. Passenger steamers also ply daily during the summer months between B. and Belfast. Pop. '71, 2560. Cattle and provisions are exported. Lead is found at Conlig in the neighborhood. It is a favorite watering-place of the middle classes of Belfast. St. Cungall, in 555, founded Bangor abbey ("Ban-choir," the "White Choir," whence the name Bangor). From this abbey, Alfred selected professors when he founded the university of Oxford. In the 9th c. it had 3000 inmates.

BANGOR, a city in the state of Maine, 231 m. n.e. of Boston, on the right bank of the Penobscot, about 60 m. from its mouth, and at its confluence with the Kenduskeag, which intersects the city, and affords an extensive supply of water-power. At spring-tides, which here rise 17 ft., the harbor is accessible from the sea for the largest vessels, and as the navigation cannot go higher, B. is one of the largest lumber depots in the world, absorbing and monopolizing the trade of the heavily-timbered basins of the Penobscot and its tributaries. About 2000 vessels are annually employed in the trade. B. possesses several churches, a theological seminary, foundries, planing and sawing mills, etc. There are two daily and four weekly newspapers. Steamboats run between B. and the adjacent ports of Portland and Boston, and it is a station on the Penobscot and Kennebec railway. Pop. '70, 18,290.

BANGOR (*ante*), one of the most important cities in Maine. Fort Norumbega was built here, in 1656, by the French; and it was thought that a great city of that name existed (alluded to by Milton in *Paradise Lost*, in Burton's *Anatomy of Melancholy*, and by other authors). In 1769, the settlement, now under English rule, was called Kenduskeag. Finally, it got its present name from the well-known psalm tune, which was a great favorite with its minister, Seth Noble. It was incorporated as a city in 1834, since which time it has grown to nearly 30,000 in population. A navigable river, railroads, and abundant water-power combine to make B. a great manufacturing city. It is the seat of justice of Penobscot co., and a port of entry, with a capacious, safe, and easily accessible harbor. The city is on both sides of the Kenduskeag, over which there are several bridges; and over the Penobscot there is a bridge a quarter of a mile long, connecting the city with the suburb of Brewer. B. is one of the greatest lumber marts

in the union, employing more than 2000 vessels in the business. It is the seat of a Congregational theological seminary.

BANGORIAN CONTROVERSY. Dr. Benjamin Hoadley, bishop of Bangor, in a sermon preached before George I., Mar. 31, 1717, on the text, "My kingdom is not of this world," advanced opinions regarding the constitution of the church which excited strong opposition from the zealous advocates of ecclesiastical authority. A controversy ensued, which was carried on with great heat for many years, and resulted in a ponderous collection of pamphlets. See HOADLEY.

BANGOR-ISCOED (Bangor below the Wood), an inland village, beautifully situated, in a fertile and richly-wooded country, on the right bank of the Dee, on the borders of Flint and Denbigh shires, North Wales, 5 m. s.e. of Wrexham. Pop. of township (1871), 574. It was once the seat of one of the largest monasteries in Britain. This monastery was founded before 180 A.D., and contained 2400 monks in the time of St. Augustine, in the end of the 6th c., when they distinguished themselves in resisting the claims of the papal see. Ethelred, king of Northumbria, in 593, devastated the monastery, and massacred 1200 of the monks.

BANGS, NATHAN, D.D., 1778–1862; b. Conn.; a Methodist minister, commencing as in itinerant in 1801. He labored seven years in Canada, and came to New York in 1810. In 1820, he was chosen agent of the Methodist book concern; in 1828, chosen editor of the *Christian Advocate and Journal*, and in 1829 elected bishop of Canada, but declined. In 1832, he was editor of the *Methodist Magazine and Quarterly Review*; in 1836, secretary of the church's missionary society; in 1841, president of the Wesleyan university, but soon afterwards returned to pastoral work in New York. Dr. B. was the author of *Predestination Examined, Reformer Reformed, Life of Arminius, History of Missions, History of the Methodist Episcopal Church*, etc.

BANIALU'KA, a fortified t. of Bosnia, European Turkey, situated on the left bank of the Verbas, with a manufactory of gunpowder, and numerous bazaars and public baths. Pop. 8000.

BANIAN (from the Sanscrit *banij*, a merchant), a word used in India to designate a merchant or trader generally. It is more particularly applied to the great merchants in the w. of India, especially in the seaport towns of Bombay, Surat, Cambay, etc., who carry on a very extensive trade by means of caravans with the interior of Asia, even to the borders of Russia and China. Contrary to the general custom of the Indian people, these merchants travel much, and the establishments and counting-houses of Indian banians are to be found in almost every commercial town of any note in Asia. The banians form a class or division of the caste (q.v.) of the Vaisya, adopt a peculiar costume, and are strict in the observance of fasts and in abstaining from the use of flesh.

BANIAN DAYS, a sailor's phrase, nearly equivalent to the *jours maigres* of the French. The term denotes the days when no meat is served out to a ship's crew. Banian days have no longer any existence in the royal navy. The term is derived from the practice of the banian (q.v.) traders.

BANIAN-TREE. See BANYAN.

BANIM, JOHN, a celebrated Irish novelist, b. 1800, whose pictures of manners, in the form of tales, have excited considerable interest in England. His aim was to become for Ireland what Scott had been for Scotland. He has given proof of vigorous intellectual grasp and vivid fancy, in a series of pictures of life, in which he delineates the peculiarities of the Irish character in strong light and shade, and appeals forcibly to the national feeling. His *Tales of the O'Hara Family* (London, 1825) were followed, in 1826, by a second series, which did not disappoint the high expectations excited by the first. Of these, several have been translated into German by Lindau. Next appeared *The Battle of the Boyne, The Croppy* (1828), *The Denounced* (1830), *The Smuggler* (1831), *The Mayor of Windgap, Father Connell*, etc. In 1837, general sympathy having been attracted towards B.'s privations, occasioned by disease that precluded all literary exertion, a pension of £150 per annum from the civil list was awarded him by government, which was afterwards further increased by £40 for the education of his daughter, an only child. He died in poverty on the 1st Aug., 1842, at Windgap cottage, near Kilkenny.

B. failed in his attempt to portray the manners and frivolities of the higher classes; but none of his predecessors, such as Edgeworth, Morgan, and Crofton Croker, have succeeded in depicting so vividly and truly the Irish peasant, with his picturesque peculiarities in his sufferings and errors. Although generally happy in the plot and development of his story, he is too much disposed to dwell on the horrible. His denunciations may be well founded, but they disturb the poetic effect. B. was also not quite free from a somewhat tiresome minuteness of description, and his imitation of Scott is frequently very palpable.

BANISHMENT, excepting in the penal sense of transportation (q.v.) with which it is popularly synonymous, can only now be said to have a legal meaning historically. Formerly, in England, parties who were required to *abjure the realm*—that is, renounce

and depart from the country—were, so to speak, *banished;* but the word appears to have a more technical and precise significance in the Scotch law than in the English, and in Scotch law-books, is defined as the punishment of exile from Scotland inflicted on persons convicted of certain offenses for which that punishment is provided. But as a punishment, it has either been abolished in that country by express enactment or become obsolete by disuse. See TRANSPORTATION, PENAL SERVITUDE.

BANISTER, a corruption of baluster (q.v.).

BANISTER. See HALIFAX COURT HOUSE.

BANJERMASSIN, a large kingdom on the s.e. of Borneo, has an area of 5880 sq.m., and a pop. of about 150,000 souls, chiefly Mohammedans. Since 1860, it is governed by the Dutch resident for the s. and e. of Borneo, who has an assistant at Martapura, where the sultans formerly lived. B. is watered by large rivers and intersected by a chain of mountains, in several parts rising to 3000 feet. Excellent small arms are manufactured. The products are pepper, wax, edible nests, rattans, benzoin, dragons' blood, coal, iron, diamonds, and gold-dust.

B., the capital of the residency, is built on the island Tatas, about 12 m. from the mouth of the Banjermassin or Barito; pop. 35,000. In 1871, the population of the residency numbered 326 Europeans and 847,846 natives. There is a considerable trade in native products, and the imports are piece-goods, gunpowder, rice, sugar, Chinese porcelain, silks, and a few horses from Java.

BANJOEMAS', a t. of Java, 22 m. from the s. coast, in s. lat. 7° 33′ 45″, and e. long. 109° 19′ 20″. It is situated at the opening of an extensive and fruitful valley on the left bank of the Serajo. It is well built, and carries on a considerable trade Pop. 9000. B. is the residence of a Dutch governor, and has a fort and garrison. It is the capital of a province of the same name, which produces coffee, sugar, indigo, rice, tobacco, etc.

BANK—BANKING. A banker lends money at interest, usually for short periods on satisfactory security, and receives money on deposit, for which he sometimes allows interest and sometimes does not, but merely keeps it safely for the depositor. Some banks —notably the bank of Amsterdam, which, during the 17th c., was the great warehouse for bullion in Europe—were simply custodiers of coin and bullion lodged with them, for which they granted receipts transferable from hand to hand, entitling the owners to get back the gold or silver, in coin or bullion as originally deposited. But money lying in such banks was unproductive, and indeed entailed upon the owners considerable charges to pay the necessary expenses of management. In recent times the competition for money by borrowers has become so keen, and the outlets for lending it safely so numerous, that banks of this class are no longer needed. They have in fact all passed away, and the business of receiving money is now universally combined with that of lending it out. A banker does not hoard all the money deposited with him; he gives the greater portion out on loan. The advantages accruing to society from the operations of banking are thus immensely increased. A banker receives from all around him the sums of money, both small and great, which would otherwise be useless in the coffers of the owners, and lends it to those who can employ it to advantage and could not otherwise obtain it. Capital hitherto lying useless and unproductive becomes through his agency useful and productive. The direct advantages arising from such transactions are considerable. The banker, if the money is allowed to lie with him for some time, will pay the depositor interest upon it, will lend the amount to a borrower who will engage in some business transaction with it and make a profit thereby; and the banker himself will make a profit upon the difference between the interest allowed to the depositor and charged to the borrower. But besides the direct advantages, the indirect advantages are not less important. With the money thus lent out, manufacturers can purchase raw material to be worked up, and procure food and clothing for their workmen; and traders can go into the markets and purchase commodities for resale. Commodities are thus more quickly turned to useful purposes, and a stimulus is given to the production of more. But a banker deals not with the money only of others; he uses money belonging to himself. This is his *capital.* Few would be found to deposit their money with a person known to possess none of his own. If he should lend deposits to those who fail to repay them—that is, *make bad debts*—he has the means from his capital of replacing the deposits thus lost.

The services that a banker performs as the cash-keeper of his depositors are very great. In the case of persons not themselves in business, it is quite usual for a banker to make all their money-payments, beyond their small daily expenditure, and to receive the money payable to them. The money transactions of such persons are thus contained in their banker's books. This is effected by the depositor giving a check or order on his banker for the sums he has to pay; and by handing to him all the *checks* or orders the depositor receives for sums payable to himself. Suppose a person's income derived from dividends on government stock: he sends a *power of attorney* or authority to his banker to uplift the dividends for him. These are received by the banker as deposits, and are drawn out by the depositor as occasion occurs, by checks issued by the depositor to those to whom he requires to pay it away. So he may receive money due to him by a check given to him by his debtor. This check he sends to his banker, who will

obtain payment. If both persons deal with the same banker, a simple transfer in his books will carry through the transaction; and if the bankers be different, and each has received, in the course of his business, as is always happening, a check on the other, there will be a set-off between them; and two payments will be made as well as two deposits, without trouble to the persons concerned, and without the employment of any money. But this mode of managing one's pecuniary transactions is not confined to the case of those not engaged in business; on the contrary, it is followed on a scale out of all proportion greater in carrying through the money transactions of those in business or trade in the principal industrial countries.

Besides thus performing the function of cashiers to their depositors, in consideration of the profit made on their deposits, many banks allow their depositors interest on their deposits. The rate allowed is, of course, always less than that received by the banker. Frequently a depositor bargains with the banker not to draw out his deposit without previous notice, longer or shorter as may be agreed on; and in this case the banker will allow a higher rate of interest than when the deposit is repayable *on call*—that is, at any time, without previous notice. The practice of allowing interest on deposits has prevailed in Scotland since 1729, but in England is of later growth, and not invariable; the rule there being rather to allow interest on fixed deposits only, and to allow no interest on money at call or on current accounts. It has led, of late years, to a great increase in the amount of deposits. Many persons prefer the low rate of interest which banks give, to the higher rate which may be obtained from individual borrowers, or to the greater return which may be received if they traded on their money.

Occasions are always occurring for withdrawing deposits, as well as making them. Traders and commercial men, for example, day by day, deposit with their bankers the drawings or sums of money which they receive in the course of their business; and, on the other hand, day by day, draw out such sums as they require to pay away in purchases of goods, in wages, rent, and other expenditure. A bank, therefore, while continually receiving deposits, is continually repaying deposits; and the amount uncalled for is subject to a daily fluctuation. At one period of the year, or in a certain condition of trade, the amount of deposits may be high; at another, low. As it is a principle, at the very root of banking, that money deposited shall be returned, either on demand, or punctually at the expiry of a stipulated notice, it follows that banks must always have in their coffers as much of the money deposited with them as there is the least likelihood of being called for by depositors. When business is in its ordinary condition, a bank can, after some experience, approximate pretty nearly to the amount of the greatest demand for a return of deposits throughout the year, and provide accordingly. But sometimes the credit of a bank becomes doubted, either from causes peculiar to itself, or on occasions of a *panic* or general distrust, when all who own money wish to have it in their own possession. In these cases, there is a *run* on the bank for repayment of its deposits, and the amount called for may be far beyond the maximum demanded in ordinary times. If the bank has not retained as much of the deposits in its coffers as meet the demand, it is said to *suspend payment*, and, as a general rule, it must wind-up its business; the confidence of the public that it will in future restore its deposits on demand being now destroyed. There are two prime rules in safe banking: the one is, that the bank shall lend its deposits only on undoubted and readily reliable securities, however low the profit; and the other is, that the bank shall retain a sufficient amount of its resources—and this is called the *reserve*—to meet the possible demands of the depositors, even in cases of a run, although there may be no reason to expect one; for when a run comes, it seldom casts its shadow before. But it is evident that the greater the *reserve* of a bank, the less the amount of deposits which it can lend out and draw interest for; hence the temptation which banks lie under of imprudently lending out a too great proportion of their deposits; and it is their yielding to this temptation which almost always precipitates the failures of banks.

The *reserve* of the banking department of the Bank of England is always in coin, or, what is the same thing, in notes against which there is coin lying in what is called the *issue* department of the bank. In the case of all other banks in this country, the reserve is only partly in coin; sometimes the proportion of coin is very small. A great portion of the reserve is generally in Bank of England notes, equivalent, of course, to coin. These other banks also hold a portion of their reserve, in the shape of government stock, in which they have invested it. In this way, the banks obtain a return on this last portion of their reserve, in the dividends or interest paid by government on the stock—this return being less, indeed, in the usual case, than if the bank had lent out the money in the ordinary course of business, but better than no return at all, as must be when the coin or notes are lying idle. The reason why government stock, in Great Britain, is a safe reserve is, that it is sure to command a purchaser at all times. If there be a run on a bank, it immediately finds a purchaser for the stock, and with the price, whether paid in gold, or in Bank of England notes, the only other legal tender, it meets the demands of its depositors. Sometimes, a bank has its reserve in the form of a deposit at the Bank of England; or, if a provincial bank, with some London bank which has its own reserve there. From the Bank of England being the channel through which, directly or indirectly, payments are made, and moneys received, by other banks, it is more convenient for them to have their reserve lying as a deposit in it than lying as

gold within their own walls. In the case of a demand on their reserve, the banks will draw out their deposits, in notes, or, if gold be in demand, in gold, from the Bank of England. Whether, therefore, the reserve of a bank is invested in government securities, or is deposited in the Bank of England, or is in Bank of England notes, it is from the coin in that bank that the gold comes in the case of a run. It is apparent from this that it is essential to the stability of all banks in this country, so long as they themselves do not keep a sufficient reserve of coin in their coffers, that the Bank of England shall always be possessed of coin, and never be unable, on demand, to pay its depositors in gold, or to give gold in exchange for all its notes that may be presented to it. It may be added, that while banks gain, through the annual dividends, in keeping their reserve in government stock, they run the risk of a loss in the event of their requiring to sell it in the time of a panic. For at such a time, when many securities and stocks become unsalable, and all of them suffer depreciation in value, government stock itself falls in price, although less so than the others. Banks often invest portions of their reserve in other stocks than government stock. The higher return obtained on these other is, however, outweighed by the greater risk of depreciation in their value, whether continued unsold or thrown into the market for sale in times of panic.

We have hitherto been treating banks as banks of *deposit* and *loan;* but many of these banks, in all countries where banks are known, are also banks of *issue.* Banks of deposit, as has been mentioned, make loans from their capital and deposits. If from capital, the banker has no greater profit by the transaction than if he had lent out his money in any other way, equally safe, and involving the same amount of trouble. If from deposits, the interest he receives, in so far as it exceeds the interest, if any, paid to the depositors, and a ratable proportion of the expense of carrying on the business of the bank, is pure gain to him. But a banker may give the loan from his own notes, and in that case his gain is still greater. A bank-note is simply a written promise by the bank issuing it, to pay to the bearer, on demand, a sum of money—that is, in coin of the realm. Of course, the borrower would not accept a loan from a bank in its own notes, unless he believed that it could redeem its promise of paying in coin, and that the public were of the same opinion; for the moment that a suspicion arises that the promise will not be made good, the note will cease to pass from hand to hand as coin, or to perform all the functions which coin performs. But when the loan is accepted in a bank's own notes, it is evident that the interest which the bank draws for the loan of its promises to pay is pure profit, except the rateable proportion—as in the other cases—of the expense of carrying on its business, and the expense of the paper and printing of the notes with the government stamp duty. In other words, a bank which can get people to pay to it interest for the loan of its promises to pay, draws the same income—barring the comparatively trifling expense of manufacturing the written promises—as a bank does which has to provide itself with gold for making its loans. The motive which a bank has to extend its issues on loans is therefore apparent, so long, of course, as it is not compulsory on it to retain unemployed in its coffers as much in gold as it issues in notes.

But it does not follow that when a bank makes a loan in its own notes for a definite period, it will really obtain the benefit of the whole of the interest on it for that period; for the borrower does not apply for the notes that he may keep them beside him, but that he may pay them away in making a purchase, or in liquidating a debt, and this, most commonly on the very day he receives them. If the person to whom the notes are thus paid by the borrower has himself no purchase to pay for, or no payment to make, he may, the moment he gets them, return them to the bank that issued them, to lie there on deposit. If the bank pays interest on deposits, as most banks do, then out of the interest drawn by it on the original loan, it will have to pay interest to the depositor of the notes; in other words, the loan is no longer a loan of its notes, but a loan from its deposits. Or, the person receiving the notes from the borrower, may immediately present them to the issuing bank for coin, instead of depositing them. Here, too, therefore, the loan that was made in notes is now converted into a loan of coin, that was in reserve from previous deposits, or that was part of the bank's own capital; in which cases, the bank obtains no advantage whatever in having made the loan originally in its notes. It might equally well, so far as profit is concerned, have originally made it in gold from its reserve of deposits or capital. Notes generally find their way back to the bank that issued them through other banks, into which they have been paid as deposits, or for the liquidation of debts due to them. These banks suffer the loss of profit or interest on the amount of the notes thus received by them so long as they keep them; they therefore immediately present them to the issuing bank for gold, to replenish their own reserves, or to lend out; or, what is the same thing, they present them to the issuing bank for government stock, or other securities bearing interest, and which that bank has had to provide from its capital and deposits.

It will now be apparent to the reader that there are two checks which prevent a bank issuing notes to any extent it pleases. In the first place, there must be a demand for its notes by borrowers. It is only to people in good credit, and likely to make a profitable use of them, that a bank will lend its notes, and such people will not take an increase of loans unless trade is increasing, and new opportunities be presenting themselves for profitably employing the notes borrowed. True, banks, when imprudently conducted, or when deceived in the character of their customers, frequently lend their notes to reck-

less persons, who overtrade with them, and become bankrupt. But banks commit this error when they do commit it, to a far greater extent by loans of their deposits and capital than by loans of their notes. In the second place, the immediate return of the notes, chiefly through other banks for gold, or for other portions of the reserve of the issuing bank, is a check to its issuing more notes than it has a reserve to meet. This return of notes through banks is called the *exchange* of notes—the notes issued by a bank being returned to it in exchange for the notes held by it of another bank.

Besides issuing its notes in loans, a bank may issue them in repayment of deposits. In this case, there is the same profit to the bank as in the other case. The bank gets the profit which it makes on the money which was originally deposited or lodged with it, without having to pay interest to the persons who made the deposit or lodgment; the deposit, or money lodged, having now been repaid in its notes. But here, too, these notes are equally liable to be returned to the issuer as when they are issued on loans.

Of all the notes issued, in whatever way, by banks, a certain amount is not returned to them, but is kept in circulation, being what is required by the necessities of the public for use as money, passing from hand to hand. It is of course on this portion that the banks make their profit; and, in consequence of this profit, they are able to afford banking facilities to the public more cheaply than they could otherwise do. The profit is just the interest on the notes in circulation—less the expense of manufacturing the notes, a ratable proportion of the expenses of conducting the banks, and the loss of interest or profit on an unemployed reserve kept from prudence, or by the requirement of law, to meet a return of notes. This interest is paid by the persons who originally borrowed these notes from the banks, and who have not repaid them; or if the banks have repaid deposits with the notes, the interest is paid by those to whom they lent what was originally these deposits. The amount of the bank-notes in circulation varies at different periods of the year: at term-times and quarter-days, when more payments than usual are made, there is a greater quantity of money required by the public than at other times, and the notes in circulation increase in amount. This addition to the circulation is drawn from the banks by the depositors or borrowers. After it has served its purpose, this additional quantity gradually returns to the banks as deposits or in repayment of loans. If the credit of an issuing bank is at any time suspected, the holders of notes will present them for gold, just in the same way as its depositors will call for a return of their deposits; and this risk must be provided against by a corresponding increase of its general reserve, on which, of course, it makes no profit. It has been generally imagined that, when issuing banks suspend payments on a run, the run is one on the part of their note-holders; but this is only a popular error. In a well-established bank, the amount of its notes in circulation is of little importance compard to its de osits; and though the holders of small sums in notes may be more apt than depositors to take alarm and rush in a panic to the bank for gold for its notes, a small proportion of its depositors suddenly demanding a return of their money in gold, as effectually drains a bank of its reserve, as if its whole circulation were to be at once presented to it for gold.

Banks make their loans chiefly in the form of *discounts;* that is, upon bills of exchange. Commodities in the wholesale market are generally sold on credit. The buyer promises to pay the amount at a certain date to the seller, and his promise is contained in a bill of exchange. The seller transfers it to a bank, which, on the faith of it, advances the amount in loan to him, less *discount* (q.v.), that is, interest of the money till the bill be due. This is called *discounting.* But banks lend on other securities. A holder of government stock, for example, will obtain a loan on the security of his stock: the banker being entitled to sell it, and repay the loan from the price, if the borrower fail to make punctual payment. So also, the holder of stock or shares in any public company, as a railway company, or of a debenture or bond due by such, will, where the company is believed to be in a sound condition, or the security is salable, obtain a loan from a bank. The owners of commodities lying in a public warehouse, may obtain a loan on depositing with the bank the *warrants* or certificates of ownership. Loans, too, are occasionally made for short periods on the mere note of hand of the borrower, when the banker is satisfied of the ability of the borrower to repay the money. It is seldom in Scotland that banks lend on mortgages over land. Borrowers, in these cases, generally take loans to lie unpaid for a few years; but to have his money locked up in that way does not suit the trade of a banker. Where a banker finds the security which he has received to be insufficient, and repayment of the loan is not forthcoming, he will, of course, like any other trader, to avoid making a bad debt, take any other security the debtor can give him—such as a manufactory or a mine. Banks have in this way frequently become involved in manufacturing transactions, in their attempts to make more money of the securities than they would have done by an immediate sale of them; they have become manufacturers and miners, and suffered great losses in consequence. And it is not to be supposed that banks always abstain from making loans when the security is known to be doubtful; far from it; banks, like other commercial establishments, have been, on many occasions, recklessly managed. In trying to push business, they have made loans on insufficient security, and banks are under strong temptation, to which they frequently yield, when a trader largely indebted to them is approaching bankruptcy, to sustain his credit by additional advances, in the hope that he may retrieve his affairs, and pay in full

both the old and the new advances. The result is often the loss of both. Conduct of this kind has been the ruin of many banking establishments in England, of two or three in Ireland and Scotland, and elsewhere.

Bankers perform another very important function: they *remit* money from one place to another. One illustration will serve to explain how this is managed. A debtor in Edinburgh makes a payment to his creditor in London in this way: he pays the money to a banker in Edinburgh, who, for a small charge, called the *exchange*, gives him a draft for the amount on a banker, his correspondent, in London. The debtor transmits the draft to his creditor, who presents it to the London banker, and receives the money from him. No actual transmission of the money, however, takes place, for there are debtors in London requiring to pay money to creditors in Edinburgh, and these debtors effect the payment by giving the money to the London banker, and obtaining his drafts on the Edinburgh banker. The one set of drafts are thus set off against the other. Not only may remittances between two places be thus made without the use of money, but the payments in both places may also be made without it. The debtors may pay for the drafts by checks on the banker who grants them, and the creditors may receive the money by drawing checks on the banker by whom the drafts are made payable. For another function of banks, see MARGINAL CREDITS.

The large amount of money transactions carried through without the intervention of coin or bank-notes, in a country like England, is inconceivable to those not engaged in business pursuits. The manner in which these transactions may be effected without money, would be at once apprehended, if all persons in the same locality dealt with the same bank, and if all the banks scattered throughout the kingdom were only branches of the same establishment. But in practice, matters are so managed as if this were the case. The checks, bills, or other drafts which come into the hands of a banker, drawn on (that is, payable by) other bankers, are set off and liquidated by drafts, which they have received, drawn on him. The balance or difference only is paid in money. In London, the center of the money-world, there is an establishment called the clearing-house (q.v.), of which most of the London banks are members. There, at a fixed hour daily, attendance is given by a clerk from each of these banks, who presents all the drafts immediately payable which his bank holds on the others; the balance or difference, on the whole, for or against each bank is ascertained; and the bank which holds a less amount of drafts on others than they hold on it, pays the difference by checks on the Bank of England. The lowest clearing for an entire week between the 4th of Oct., 1877, and 2d Oct., 1878, was £71,120,000, and the highest £133,921,000. The total clearings from Oct., 1877, to Oct., 1878, were £5,066,533,000. There are similar clearing-houses in some provincial towns.

Bank of England.—This bank, the most important in the world, was projected by William Paterson (q.v.), and was incorporated July 27, 1694. It was constituted as a joint-stock association, with a capital of £1,200,000, which was lent at interest to the government of William and Mary, at the time in a state of embarrassment. At its very outset, therefore, the Bank of England was a servant of government; and in a lesser or greater degree, it has enjoyed this character through all the stages of its subsequent history. At first, the charter of the bank was for 11 years only; but in consequence of the great services of the institution to government, its charter has been at various times renewed. The last renewal was in 1844, and the charter of that year still subsists, its terms being subject to modification or revocation by the legislature at pleasure. By the act or charter of 1844, the bank was divided into two departments—the *issue* and the *banking*. What led to the division was this: it was supposed that, when a foreign drain of gold from us set in, it would, if the currency or circulation in this country had been purely metallic, have produced a contraction of the circulation, and a consequent fall of prices, and, as an ultimate result, the cessation of the drain. It was further supposed that banks could issue their notes to any extent they pleased; that their excessive issues increased the currency, and therefore increased prices, which in their turn led to foreign drains; and that, on the occasions of these drains, the continued issues prevented the natural and desirable contraction of the circulation, and aggravated the commercial convulsions occurring at such periods. The object of the act of 1844 was to prevent issues of notes beyond a certain amount, unless against an equal amount of gold held by the issuing bank, so that the mixed currency of notes and coin might thus expand and contract like a self-acting metallic currency. Experience, however, has shown, that when these foreign drains occur, the gold exported is taken chiefly from the reserves in the Bank of England, being withdrawals of deposits or loans by the bank; and that the amount of notes in the hands of the public has not been affected by the legislation of 1844. In practice, whenever there are signs of a foreign drain, and the reserve of the bank is diminishing, the bank counteracts the tendency to a drain by raising the rate of discount and restricting its loans; the purchasing power of the public is thereby limited, and prices kept down; and, at the same time, gold is attracted to this country for investment. The circulation is in reality not interfered with. It was also intended by the act of 1844 to add to the security of bank-notes by insuring a supply of gold to meet the payment of them at all times. But the solvency of the Bank of England is undoubted; its notes would at any time be taken as gold; and this effect of the act of 1844, and the supplementary act of 1845, has in the case of the notes of other banks been hitherto inappreciable.

In the *issue* department of the Bank of England, its sole business is to give out notes to the public. Before the separation of the departments, the government was due to the bank £11,015,100. This sum was declared to be now a debt due to the issue department, and for the issues of notes to that amount, no gold requires to be held by it. This was just the same thing as if the bank had originally lent £11,015,100 of its notes to government, and these notes had found their way into circulation. The bank was also allowed to issue additional notes on securities—that is, to lend them to a limit which at present amounts to £3,984,900, and this also without holding gold. The amount of notes which may thus be issued, without gold being in reserve against it, is £15,000,000. All notes issued above that amount can be issued only in exchange for gold. At the passing of the act in 1844, the limit of notes to be issued against the government debt and securities was fixed at £14,000,000—past experience having shown that there was not the least risk of their being at any time less than that amount of Bank of England notes in the hands of the public. The addition of the £1,000,000 is an extra issue, authorized by the act, in consequence of certain issuing banks having since ceased to issue. The bank has to account to government for the net profit of this issue loan of notes of £1,000,000, and the profit the bank derives from its issue department is the interest received on the £14,000,000 of government debt and securities, which, at 3 per cent, is £420,000 yearly. But out of this the bank pays to government, for its banking privileges, and in lieu of stamp-duties, £180,000. If we assume the expense of the issue department to be £160,000, the net profit upon it would be £80,000. The bank also makes a profit upon bullion and foreign coin. These are brought to the bank for notes; they are worth £3 17s. 10½d. per ounce; but the bank is obliged by its charter to purchase them at £3 17s. 9d. The holders prefer taking this price to having their bullion and foreign coin coined, free of charge, at the public mint, as the delay in the coining is equal to a loss of interest of 1½d. per ounce. The amount of notes in the hands of the public averages about £25,000,000; but the amount issued by the *issue* department is greater. The difference is the amount lying in the *banking* department, and represents the reserve of gold of that department; that is to say, the banking department retains only a half or three fourths of a million of coin, and transfers the bulk of its reserve to the issue department, in exchange for notes. We therefore require to regard the reserve of the banking department as gold, though lying in the shape of notes issued by the other department.

Viewed in its *banking* department, the bank differs from other banks in having the management of the public debt, and paying the dividends on it; in holding the deposits belonging to government, and making advances to it when necessary; in aiding in the collection of the public revenue, and in being the bank of other banks. For the management of the public debt, the bank receives about £247,000, against which there has to be set £124,000 of charges. The remaining profits of the bank are derived from its use of its deposits, on which it allows no interest, and of its own capital. The capital was originally £1,200,000; in 1816, it reached £14,553,000—the present amount. There is besides a rest of about £3,500,000. In 1877-8 the public deposits varied from £3,422,248 to £19,852,358, and the private from £19,629,343 to £27,321,423; the maximum of deposits, public and private, was £43,047,038.

In 1797, the bank found itself likely to be obliged to suspend payments, and its notes were declared by law a legal tender, although no longer convertible into coin. This state of matters continued till 1821. The notes during this interval not having been convertible into coin on demand, there was no check upon the bank in the amount of its issues; and the currency became depreciated—that is, a £5 note would not exchange for five sovereigns; and every man to whom £5 was due, was thus obliged to accept payment in a £5 note, not worth £5. It is, however, said that the value of gold at the time was enhanced owing to absorption by hoarding and by military-chests, and that the depreciation was more apparent than real. The export of gold following on a rise of prices occasioned by an issue of bank or government notes is unlimited, except by exhaustion, if these notes are not payable in coin on demand, and are issued without any check from without or self-imposed. But as prices estimated in these notes rise, the price of bullion, like other commodities, rises too, and the price of coin which can be converted into bullion, or be used abroad at its previous purchasing power, rises also. Since 1821, the bank has been oftener than once on the verge of a suspension of payments, owing to foreign drains of gold. The separation of the bank into two departments is regarded by many as having a tendency to produce a suspension in times of panic, when the reserve is reduced by withdrawals to supply a foreign drain, or to meet an internal run. Before the separation, the bank, in the case of withdrawals of gold, had the whole amount of gold within the bank to meet them; but now it loses the command of all the gold in the issue department. It cannot get that gold unless in exchange for notes, but, its reserve being reduced or exhausted, it has none to spare. The restriction of credit consequent upon the approach to an exhaustion of the reserve of the banking department, is so great, that the fear of it occasions a panic; and in 1847, 1857, and 1866, on the possible suspension of payments by the banking department, owing to a reduction of its reserve, being apparent, the government of the day took the responsibility of authorizing the bank to lend additional notes, not represented by gold, which was an indirect way of getting at the gold in the issue department, where the object of

the borrowers was to obtain gold. In 1857, it was found necessary to take the benefit of this authorization.

The bank of England is situated in the center of London; but it has a branch in the w. end, and nine branches in the provinces.

Joint-stock Banks in England and Wales.—In 1878, there were 119 of these banks, of which 52 in the provinces were entitled to issue notes to the amount of £2,164,221 without its being compulsory to hold any gold against them. But as they are prohibited from exceeding their authorized issue, the amount of notes actually in the hands of the public is always somewhat less. The deposits of the 10 joint-stock banks in London which may be considered London banks, and excluding the national provincial bank of England, the national bank, and the Scotch banks, who, although they carry on business in London, have the great bulk of their business in the country, amount to about £80,000,000, and the acceptances granted by them to about £17,000,000. Their paid-up capital is £9,270,000.

They all, it is understood, allow interest upon money deposited to remain for some time, but generally do not allow interest on money lodged upon current accounts or at call.

Private Banks in England and Wales.—Of these there were 248, of which 56 were in London. Of the provincial banks, 108 had an authorized issue of £2,295,073.

In the case of all these banks, whether issuing or non-issuing, their profits are chiefly derived from the use of their deposits.

There are also in London, 56 foreign, Indian, and British colonial joint-stock banks.

Banks in Scotland.—The earliest banking institution in north Britain was the bank of Scotland, instituted by a charter of incorporation from the Scots parliament in 1695. The original capital was £1,200,000 Scots, or £100,000 sterling. In 1774, the amount of stock was extended to £200,000 sterling; now it is £1,250,000 sterling. In 1727, a new and similar establishment was constituted under the title of the royal bank of Scotland, whose advanced capital is now £2,000,000. In 1746, another association was formed, and incorporated by royal charter, with the title of the British linen company. From £100,000, its capital has increased to £1,000,000. Besides those three banks, there are in Scotland other seven joint-stock banks, with capitals varying from £1,000,000 to £150,000. There are now no private banks. The amount of deposits is probably about £70,000,000, on which interest is allowed. Their authorized issue of notes is £2,676,350, but their actual issue is about double that amount. The western bank, with a capital of £1,500,000, a circulation of above £400,000, having 1300 share-holders, and about 100 branches, suspended payments in 1857, owing to a reckless system of discounting bills. The share-holders, however, being under unlimited liability (see JOINT-STOCK COMPANY), neither the depositors nor the note-holders sustained any loss. In Oct., 1878, the city of Glasgow bank, with 133 branches, suddenly suspended payments; the liabilities amounting to £12,400,000, and the estimated assets, £6,300,000, leaving a probable deficiency of £6,100,000. It was found that for three years before the stoppage, the states of the bank's affairs, issued annually to the share-holders, had been falsified, and that advances had been made to four firms against utterly inadequate securities, to the enormous sum of nearly £6,000,000. The directors and the manager were tried for and convicted of tampering with the reports, and sentenced to imprisonment. It has been arranged to wind up the bank by liquidation, and it is feared that the calls to be made upon the share-holders will involve nearly every one of them in utter ruin. In consequence of £400 of the stock being held by the Caledonian bank in security of an advance, it has had temporarily to suspend payment.

In consequence of allowing interest on deposits, the banks in Scotland may be said to hold the whole capital of the country, minus only the money passing from hand to hand. This wide-spread system of depositing is greatly aided by the establishment of branches from the parent-banks; and these branches are found in every small town in the kingdom. The entire number of branch-banks in Scotland in 1879 was about 850. At these branch-banks, the agent (usually a respectable person in business) discounts bills within certain limits, issues letters of credit, and pays out notes, and also gives cash on demand for them; though, strictly, the notes of a bank are only payable on demand at the head-office. By a strict system of supervision, Scottish branch-banks are usually well conducted, and are of great service in every department of trade. For one thing, they have powerfully contributed to extinguish burglary and highway robbery, as no one thinks of keeping money, except to a trifling amount, either in his house or about his person. At all the great fairs, bankers attend to receive deposits, and to pay checks. Forgeries of Scottish bank-notes are now unknown.

The banks in Scotland, like the banks in Ireland, but unlike the provincial banks in England, are allowed to issue notes beyond their fixed issues, on holding gold equal in amount to the extra issue. But as the gold thus retained is, like the other gold in reserve, liable for all the deposits, as well as for the whole circulation of a bank, if it should fail, the security of the establishment is increased only in a small degree by this arrangement, which, apart from the loss of profit to the bank on the gold unemployed, is attended with inconvenience at those seasons when the circulation is extended. In Scotland, and Ireland also, banks can issue one-pound notes; the English banks are not permitted to circulate notes of less value than £5.

Besides employing money in discounting bills, the Scottish banks grant loans of fluctuating amount, called *cash-accounts* or *cash-credits*. By a cash-account is signified a process whereby an individual is entitled to draw out sums as required, to a stipulated amount, and by an implied condition to make deposits at his convenience towards the liquidation of the same. On entering into this arrangement, he finds security to the bank that he will repay to the bank, whenever called on, the balance of sums drawn out, less those paid in, with the interest that may be due. These accounts are balanced yearly, like current or deposit accounts. The only difference between the latter and a cash-account on the face of them is, that if the credit allowed on the cash-account is being made use of, the balance is in favor of the bank; whereas, on the other kind of accounts, the balance is in favor of the bank's customer.

Banks in Ireland.—There are nine joint-stock banks, having 448 branches and sub-branches. Their authorized issue is £6,354,494; of which £3,738,428 is that of the bank of Ireland. It is a national bank, lending £2,630,769 of its capital to government. It was established in 1783, with privileges resembling those of the bank of England. Its capital is £2,769,230, and its rest £1,034,000. The capitals of the other banks vary from £250,000 to £1,500,000, and the total capital of the joint stock banks in Ireland is £6,809,-230. Six are banks of issue. The amount of deposits in the joint stock banks in Ireland in 1878 was £31,745,000; in 1868 it was only £22,163,599. Interest is allowed on money deposited for a stated period, but not money at call, or as a rule on current accounts. There are also three private banking firms in Dublin.

Foreign and Colonial Banks.—On the continent of Europe, there are both national or incorporated banks and private banks. The national banks are, to a greater or lesser extent, government establishments, managing the public debt and finances, and, unlike the bank of England, subject to government influence or interference. In India and the British colonies, there are joint-stock banks and private bankers. The joint-stock banks of Australia are establishments of magnitude. The United States of America are overrun with banks. Insufficient capital, reckless management, and the smallness of the reserve kept, have frequently led to the suspension of payments of these banks. At all times the number of forgeries of bank-notes in the United States is very considerable, and great caution requires to be exercised in accepting notes as payment.

BANK—BANKING (*ante*). The main principles of banking in the United States agree generally with those in other business countries, with such exceptions as are involved in the present system of national banks. Indeed, the modern English system of B. originated in the United States, while they were English colonies. As early as 1690 the colony of Massachusetts issued bills of credit to a considerable amount, making the paper legal tender for taxes and other debts, the notes being payable to bearer on demand. This was five years before the establishment of the B. of England (opened Jan. 1, 1695), and William Patterson, the father of that remarkable fiscal agency, had been in the colonies, and took especial interest in the Massachusetts experiment. In the exigencies of the campaign against the French in Nova Scotia, in 1745, Massachusetts again issued paper currency; and when England paid nearly $200,000 for the cost of that expedition, the colony redeemed her paper at the rate of $11 currency for $1 of silver. Other colonies issued legal tender, and about the time of this redemption the paper of some of them was rated per dollar par, as follows: New England provinces, 11 for 1; North Carolina, 10 for 1; South Carolina, 7 for 1; New York, 2 for 1; Pennsylvania, 1.80 for 1. In 1712, South Carolina set up a bank, and issued nearly $250,000 in bills, to be retired at the rate of one twelfth annually until all were redeemed. This provision increased their value in the first year or two about 100 per cent. In 1723, Pennsylvania began by an issue of $75,000, and half a century later doubled the amount. In 1739, Massachusetts established a regular bank which issued bills of credit.

The revolution had to be provided for by extraordinary means; in May, 1775, the continental congress authorized the issue of bills to the amount of $3,000,000, making them legal tender. Within two years this currency began rapidly to depreciate, under constantly increasing issues, which, in 1779, had reached $160,000,000. Congress then directed the issue of an additional $40,000,000, and declared that to be the final extent. Though this promise was kept, the depreciation continued, and by 1781 continental currency was good for nothing as money. Some years after the foundation of the present national government, the old currency was redeemed, at the rate of about 100 to 1. On the last day of the year 1781, congress chartered the bank of North America in Philadelphia, and both Pennsylvania and New York also granted charters to the same concern the next year, though it did not go into operation for nearly two years. The bank of New York was chartered in 1784, and the bank of Massachusetts, at Boston, in the same year. But these institutions were unable to supply the currency required, and other states began to issue bills of credit, or to charter banks, and in some, personal property of certain kinds was made legal tender for ordinary debts. But all further issues by states, as such, were forbidden by the federal constitution, which went into operation in Mar., 1789. Then, among the early movements in congress, came a charter for a bank of the United States, which was carried after a long contest. The charter ran 20 years from Feb. 25, 1791; capital, $10,000,000, of which the United States government took $2,000,000, thereby having a share of the directors; and its bills were made good for the liquidation

of all debts to the government. When the time came for renewing the charter, the country was at war with England; there were nearly 90 state banks to oppose the rechartering, and the effort failed. The old bank failing also to get a state charter, immediately wound up its affairs. It had been successful and had paid 8 to 10 per cent a year to its stockholders. State banks increased, and in 1813 there were 150 of them, with circulating notes amounting to $62,000,000. In 1814, the New England banks suspended specie payments, but resumed at the beginning of 1817. Meantime, state bank notes were depreciating. In 1814, those of Baltimore were down 20 per cent, and those of New York, 10 per cent. The news of peace raised their value 5 and 10 per cent; but they were subject to sudden fluctuations; the federal government had no control over the states, and the states had little over the bankers. The old "regulator" was seriously missed, and, April 3, 1816, congress chartered the second United States bank at Philadelphia, with power to establish branches. Its capital was $35,000,000, of which the federal government took $7,000,000; the bank with its branches was made the official depositary of government money; its bills were legal tenders, and it was the agent for negotiating federal and state loans. This compelled the state banks to resume specie payments, and business again moved forward steadily. State banks, however, grew in number rapidly. In 1816, there were 246, with $90,000,000 capital. In 1830, when the rechartering of the United States bank was proposed, there were 330 state banks, with $145,000,000 capital. President Jackson in his message, Dec., 1829, expressed his opposition to the United States bank, and his expected veto of the bill to renew the charter came in July, 1832. The next move was to remove the deposits of public money from the bank. This could be done only by order of the secretary of the treasury, and as that officer refused to conform to the president's wishes, he was summarily removed, and a more tractable man was appointed in his place. The old bank, that had more than once saved the credit of the nation, was crippled, and went down. In the wind-up it was found that its whole capital was lost, though it managed to pay its debts. Its last operations were under a charter from the state of Pennsylvania.

The refusal to continue the national bank gave full scope to state institutions, and they grew with mushroom rapidity. In 1837, there were 634 of them, with a capital of $291,000,000, $149,000,000 in circulating notes, $127,000,000 in deposits, and $525,000,000 in loans and discounts. The crash surely impending was hastened by an enormous crop of cotton in 1836, a consequent decline in prices, and the depreciation of the credit of cotton dealers and their backers. The tumble began in 1837, and by the 1st of June there was an entire suspension of specie payments; values fell from dollars to shillings, all business was deranged, millions of people were reduced from comparative ease to sharp poverty, and a period of wretchedness began which continued nearly five years. However, congress passed a general bankruptcy law, the states assisted, by limitation and other laws, and by 1843–44 the country had nearly recovered. The banks had many trials; some resumed, only to suspend again, and many went into liquidation. Congress passed the independent treasury law, and thereafter the federal government had no direct concern in banking until the rebellion broke out. The old United States bank had its final downfall in the crash of 1837. That crisis taught wisdom to the state banks, and a general retrenchment was the consequence. Between 1838 and 1842, the number of banks was reduced from 675 to 577; capital from $317,000,000 to $229,000,000; circulation from $116,000,000 to $59,000,000; and discounts from $486,000,000 to $254,000,000. Further security was demanded by the public, and among the new measures were the Suffolk bank plan in Massachusetts, and the New York safety-fund system. The Suffolk bank plan was merely an arrangement whereby that bank was made the channel through which all notes of New England banks that found their way to Boston, as most of them naturally did, were at once forwarded to the issuers for redemption. The result was that all solid bankers found it for their interest to deposit with the Suffolk a redemption fund, as that insured the acceptance of their notes.

The New York safety-fund system, which is the cardinal principle of the present national banking plan, required each bank to deposit, with the banking department of the state, securities consisting of federal or state stocks, or bonds and mortgages, which, in case of the failure of the bank, were sold, and the proceeds applied to the liquidation of its debts. In 1857, there was another crash, followed by a general suspension of specie payments; but the depression did not long continue.

Some of the serious evils, avoided to a great extent by the issue of greenbacks and national bank-currency, were counterfeited or altered bills. When almost every bank had its own plates for six or more denominations of notes, the land was full of counterfeits and alterations, and no business man ventured to accept a bank-note not well known to him, without previous comparison with a detector. In 1862, there were counterfeits on the notes of 253 banks, besides 1861 bills imitated, and 1685 entirely spurious notes. On the best notes there was a discount in the business centers of from 1 to 10 or even 15 per cent; and exchange was more variable than the weather. The "wild-cat" and "red-dog" banks of Michigan, and other western states, were notoriously unsafe. A dozen of them would club together to make a show for one only, when the examiner came along, and the same specie would be an hour in advance of him all along his route. The "red-dog" bank was so-called because of its movable nature, and of the color stamped on its notes. Established in one place on Monday, the "banker" might pack his carpet-bag

at night, and on Tuesday open his bank 50 miles away; in which case he stamped in red ink on the face of his notes the name of the place in which the "banking-house" was last established.

The war of the rebellion made large issues of credit necessary, and among the earliest financial measures was a tax on banking, with certain inducements intended to float government loans by means of banks, and the establishment of the national banking system. The measures were successful, and the state institutions rapidly came into the new system, so that in the beginning of 1866 nearly 1600 of them had become nationalized. When the war began in 1861, the paper in circulation in the country was $200,000,000, of which about three fourths was the issue of loyal states. The specie available for circulation was estimated at $275,000,000. The government soon borrowed from the associated banks in the large cities $50,000,000, for which demand notes were issued, that were not at the time legal tender. In Feb., 1862, congress authorized the issue of $150,000,000 in notes, of which $50,000,000 was for the withdrawal of the demand notes. The last issue was legal tender, except for duties on imports and interest on the public debt. The banking law of Feb. 25, 1863, still in force, created a currency bureau in the treasury department, at the head of which is the comptroller of the currency, who has power to authorize banking by associations of not less than five persons, and a minimum capital (unless in very small places), of $100,000, one half to be paid at once, and the remainder in six months. Before commencing business, the association must transfer to the treasury of the United States interest-bearing bonds of the national government to the amount of one third the capital; whereupon they may receive circulating notes, registered and countersigned, equal to 90 per cent of the market value of the stocks deposited, but not beyond the amount of their par value. The entire amount of currency to be issued is limited to $300,000,000, one half to be apportioned among the states according to their representative population, and the other half with regard to the existing banking capital, resources, and business of the several states. Nearly all the states conformed to this national system, withdrew their old notes, and took new ones from the treasury. The currency then came to consist of the notes of these banks, and the treasury demand notes, or "greenbacks," the whole amounting in 1865 to nearly $450,000,000. The national notes are quite as good as the demand notes, and circulate as freely, their final payment being assured by deposits in the treasury department.

Of course this flood of paper soon drove specie out of circulation, and little was seen of gold and silver, except at the custom houses and sub-treasuries, until the general resumption, Jan. 1. 1879. In the meantime there came another financial crisis, in the autumn of 1873, precipitated by the failure of the important house of Jay Cooke & Co.; but there were no specie payments to be suspended, and the holders of national bank notes were amply protected by the treasury deposits. Still there was great financial distress for five years, gradually relaxing in 1878–79, with recovery fully established towards the close of the latter year.

Of the national banking system, it may be said that the rebellion presented to congress as its first duty the invention of some plan for repressing the heterogeneous system of banking, providing one system of a homogeneous and absolutely safe character; one which would be truly national, operating alike in every part of the United States. The necessities of the government inspired the new order, but the old was rapidly failing to meet the wants of the people; the new, therefore, may be said to have grown out of the necessities of business as well as the straits of the nation. The new system preserved all the advantages of the old, and added many new ones. It gave absolute protection to the holders of the national bank-notes, as government bonds were deposited with the U. S. treasurer in ten per cent excess of their issue for the security of their redemption. It provided security of a uniform and almost absolute character for the deposits, making the stockholder liable, in an equal amount of his stock interest, for the ultimate payment of the deposits. It provided for a uniform bank-note of equal value in every part of the country, so engraved and issued, that security against counterfeits was far better attained than ever before. It provided for a system of redemption which made exchange merely nominal, and gave to national bank-notes, issued in most distant places, a uniform value in all the great financial centers of the country. It provided a system of published reports over the sworn signatures of the executive officers of the banks, and a uniform system of examination under the direction of the comptroller of the currency.

The national banks are required to pay to the revenues of the general government as follows: 1. One half of one per cent, semi-annually, on the circulation allowed by law. 2. One quarter of one per cent, semi-annually, on the average deposits for the half year. 3. One quarter of one per cent, semi-annually, on capital not in government bonds. Their stockholders are subject to local taxation on the market value of their stock as personal property. Each bank must keep with the treasurer of the United States, in legal tender notes, for the redemption of its bills, five per cent of the amount of its circulation; and must retain constantly in its own vaults two fifths of fifteen per cent of its deposits.

The distribution and extent of banks and banking in the United States is shown in the following table, prepared by the comptroller of the currency:

NATIONAL BANK CIRCULATION AUTHORIZED AND ISSUED.

Statement showing by geographical divisions the amount of CIRCULATING NOTES *to which the National Banks in operation on June* 14, 1879, WERE ENTITLED, *and also the amount of notes which had been* ACTUALLY *issued to them.*

GEOGRAPHICAL DIVISIONS.	Associations having Capital not exceeding $500,000 each.		Associations having Capital exceeding $500,000, but not exceeding $1,000,000 each.		Associations having Capital exceeding $1,000,000, but not exceeding $3,000,000 each.	
	Capital.	Authorized Circulation 90 per cent.	Capital.	Authorized Circulation 80 per cent.	Capital.	Authorized Circulation 75 per cent.
Eastern states	$35,273,270	$35,745,943	$44,275,000	$35,420,000	$24,875,655	$18,659,737
Middle states	102,418,235	92,176,411	28,872,560	23,098,048	25,736,700	19,290,525
Southern states	28,051,800	25,245,620	2,350,000	1,880,000	.....	.....
Western states	71,183,200	64,064,880	9,760,000	7,760,000	2,450,000	1,837,500
Pacific states and territories	4,120,000	3,708,000	750,000	600,000	2,000,000	1,500,000
Totals	$301,046,505	$270,941,854	$85,947,560	$68,758,048	$55,050,350	$41,287,762

GEOGRAPHICAL DIVISIONS.	Associations having Capital exceeding $3,000,000 each.		Total Capital and Authorized Circulation.		Circulation actually issued to the Banks.	Remaining circulation not called for by the Banks.
	Capital.	Authorized Circulation 60 per cent.	Capital.	Authorized Circulation.		
Eastern states	.....	.....	$164,427,920	$129,825,680	$117,625,727	$22,199,953
Middle states	$13,200,000	$7,920,000	170,211,495	142,484,984	113,995,559	28,489,425
Southern states	.....	.....	30,401,800	27,126,620	23,579,268	3,547,352
Western states	.....	.....	83,393,200	73,632,380	57,276,342	16,356,038
Pacific states and territories	.....	.....	6,870,000	5,808,900	3,218,780	2,589,220
Totals	$13,200,000	$7,920,000	$455,244,415	$388,907,664	$315,695,676	$73,211,988

TABLES OF BANKING CAPITAL AND DEPOSITS.

GEOGRAPHICAL DIVISIONS. May 31st, 1878.	State Banks and Trust Companies.			Private Bankers.			Savings-Banks with Capital.			Savings-Banks without Capital.	
	No.	Capital.	Deposits.	No.	Capital.	Deposits.	No.	Capital.	Deposits.	No.	Deposits.
		Millions.	*Millions.*		*Millions.*	*Millions.*		*Millions.*	*Millions.*		*Millions.*
New England states	42	8.19	15.06	71	2.86	3.23	1	0.07	1.14	441	403.43
Middle states	217	42.45	122.10	916	34.48	61.92	3	0.16	1.37	190	358.68
Southern states	233	27.33	30.67	280	7.30	13.63	4	0.88	1.28	3	2.14
Western states and territories	361	46.33	61.65	1,589	33.16	105.00	15	2.13	22.39	34	39.05
United States	853	124.35	229.48	2,856	77.80	183.83	23	3.24	26.18	668	803.30

AGGREGATE AVERAGE CAPITAL AND DEPOSITS FOR FOUR YEARS.

GEOGRAPHICAL DIVISIONS. May 31st, 1878.	State Banks, Savings-Banks, Private Bankers, etc.			National Banks, June 20, 1878.			Total.		
	No.	Capital.	Deposits.	No.	Capital.	Deposits.	No.	Capital.	Deposits.
		Millions.	*Millions.*		*Millions.*	*Millions.*		*Millions.*	*Millions.*
New England states	555	11.13	422.86	542	166.53	128.83	1,097	177.64	551.69
Middle states	1,326	77.09	544.07	634	177.18	377.89	1,960	254.27	918.96
Southern states	520	35.55	47.77	176	31.49	35.94	696	67.04	83.71
Western states and territories	1,999	81.62	228.09	704	95.20	137.50	2,703	176.82	465.59
United States	4,400	205.38	1,242.79	2,056	470.39	677.16	6,456	675.77	1,919.95

The antiquity of banks is very great. In Europe, the bank of Venice, the earliest on record, started in 1171; the bank of Barcelona, in 1401; of Genoa, in 1407; and of Amsterdam, in 1609. But in the metropolitan museum of art in New York are Babylonian tablets bearing distinct records of transactions in banking that took place in the reign of Nebuchadnezzar. The earliest tablet is of the year 601 B.C. On it are memoranda of loans of silver made by Kudurru as follows:—1 mina of silver to Suta, 1 mina to Balludh, ⅓ mina to Beluepus, 5 shekels to Nabu-basa-napsati, and 5 shekels to Nergal-dann. Total, 3 minas, 5 shekels of silver. No. 2, dated at Babylon on the 12th day of the month of Sivan, in the 8th year of the reign of Nebuchadnezzar, 597 B.C., bears tabletary evidence, attested by three witnesses, of the loan of 2 minas, 10 shekels of silver, made by Nabu-suma-esir, son of Belu- * * * -ilani, son of the * * *, to Kudurru, son of Basa, son of Egibi. No. 3, dated at Babylon, month Tisri, 25th day, 8th year of Nebuchadnezzar, 597 B.C.—Loan of ⅔ of a mina, and 4 shekels of silver, granted by Belu-balish, son of Musgul, son of Epes-ili, to Kudurru, son of Basa, son of Egibi. To be repaid on the 10th of the month of Kislev. There are four witnesses. No. 4, dated at Babylon, month of Tebet, 6th day, 22d year of Nebuchadnezzar, 583 B.C., records the sale of 9 measures of corn, or the promise to sell 9 measures of corn, by Belu-basa, son of Zira-yuquin, son of Munnabitti, to Suta, son of Kudurru, son of Egibi. Three witnesses. No. 5, dated Babylon, month Ab, 21st day, 31st year of Nebuchadnezzar, 574 B.C., refers to the payment of 24 measures of corn, and 56 shekels of silver, by Kasir and Iddin-Marduku, sons of Basa, son of Nur-Sini, to Belu-nasi, son of Suzabu, son of Beludini. No. 6 is dated at Satkrini, 25th Sivan, 37th year of Nebuchadnezzar, 568 B.C. No. 7 is dated at Babylon, 12th Adar, 42d year of Nebuchadnezzar, 563 B.C. Nos. 8 and 9 are dated at Babylon, in the 2d and 3d years of the reign of Neriglissar, 558 and 557 B.C. Nos. 10, 11, 12, 13, 14, 15, and 16, are dated at Babylon, two in the 2d, one in the 4th, three in the 6th, and one in the 11th (?) year of Nabonidus, ranging, therefore, from 554 to 545 B.C. No. 17 is dated at Borsippa, in the 7th year of Nabonidus, 548 B.C. Nos. 18 to 30 date from the 8th to the 16th year of Nabonidus, 548 to 540 B.C. Nos. 31 and 32 are dated at Babylon in the 3d and 7th years of Cyrus, 534 and 530 B.C. No. 33 is dated at Lakkarrinu, and Nos. 34 and 35 at Babylon, the first in the 2d and the two others in the 6th year of Cambyses, 528 and 524 B.C. No. 36 is dated at Kharsak-Kalama, 25 Kislev, 1st year of Darius, 518 B.C. Nos. 38 to 43 date from Babylon and range from the 3d to the 26th year of Darius, 516 to 493 B.C. An interesting tablet is No. 44, which, dated at the city of Dhabi-Belu, 15th Nisan, 40th year of Nebuchadnezzar, 565 B.C., records 7 shekels of silver lent by Gimillu, son of Samsa-zira-ibni, son of Sinu-satnu, to Nabu-suma-iddin, son of Belu-balidh, son of Sakdidi, and Iddin-Marduku, son of Barsa, son of Nur-sini, in the course of the month Nisan * * * * by 1 shekel 5 times, give (back); 3 witnesses. Gimillu receives therefore 3 shekels interest. No. 45 bears an undated contract; No. 46, memoranda of loans, expenditures, etc. (undated); No. 47, also undated, similar contents; No. 48, an account of the produce of certain lands in the 14th year of Darius, with names of buyers and amounts; No. 49, an undated account of field produce, and No. 50, rough memoranda. No. 51 is dated at Babylon on the 18th day of the 14th year of Darius, 505 B.C. M. Lenormant divides these most interesting documents into five principal types: 1. Simple obligations. 2. Obligations with a penal clause in case of non-fulfillment. One he gives which had 79 days to run. 3. Obligations with the guarantee to a third party. 4. Obligations payable to a third person. 5. Drafts drawn upon one place, payable in another. He gives the following illustration of one of these letters of credit. "Four minas 15 shekels of silver (credit) of Ardu-Mana, son of Yakin, upon Mardukabalussur, son of Mardukbalatirib, in the town of Orchoe. Mardukbalatirib will pay in the month of Tibet 4 minas 15 shekels of silver to Belabaliddin, son of Sennaid. Our, the 14 arakhsamna in the 2d year of Nabonidus, king of Babylon." Then follow the names of witnesses. These Assyrian drafts were negotiable, but from the nature of things could not pass by indorsement, because, when the clay was once baked, nothing new could be added, and under these circumstances the name of the payee was frequently omitted. It seems to follow that they must have been regularly advised. It is remarkable that such instruments, and especially letters of credit, should have preceded the use of coins. The earliest banking firm of which we have any account is said to be that of Egibi & Co., for our knowledge of whom we are indebted to Mr. Boscawen, Mr. Pinches, and Mr. Hilton Price. Several documents and records belonging to this family are in the British museum. They are on clay tablets, and were discovered in an earthenware jar found in the neighborhood of Hillah, a few miles from Babylon. The house is said to have acted as a sort of national bank of Babylon; the founder of the house, Egibi, probably lived in the reign of Sennacherib, about 700 B.C. This family has been traced during a century and a half, and through five generations down to the reign of Darius.

BANK-NOTES, MANUFACTURE OF. The chief object in the manufacture of bank-notes is to render forgery impossible, or at least easy of detection. This is sought to be effected by peculiarity of paper, design, and printing, or by a combination of these means. See PAPER. The main reliance has been on mechanical design—the writing, the emblems, and the ornaments being so combined as to render forgery difficult. The ink, too, is peculiar (see INK), being the blackest and most indelible of inks. As a further security against forgery, a self-registering machine was contrived by Messrs. Oldham. Copper-

plate printing was the only printing in use for bank-notes till 1837, when a great improvement was made by Messrs. Perkins & Heath. This was the reproduction of designs by the mill and die by mechanical pressure. The pattern is engraved on a soft steel plate, which is then hardened, to transfer the pattern by pressure to a soft steel roller, on which, of course, the pattern is produced in relief; the roller or mill is then hardened, to reproduce the pattern in the plate from which the printing is to be done; and thus almost any number of plates for all common purposes can easily be produced. No bank of England notes are issued twice.

This system of siderography continued in use for bank-note printing in the bank of England till 1855, when electrotype-printing was introduced by Mr. Smee, with the assistance of the mechanical officials (see ELECTROTYPING); and since that time the notes of the bank of England have been all produced by surface-printing by the electrotype.

The usual production of notes equals a value of about £24,000,000 per week; it being the policy of the bank to renew the notes before the paper loses that peculiar crispness which distinguishes it from all other paper, and is a safeguard against forgery.

There are seventy or eighty kinds of bank of England notes, differing in their denominations or values, but similar in the mode of printing. The paper is expressly made for the purpose, by one firm only, and is remarkable for its strength, lightness, and difficulty of imitation. The bank of Ireland notes are printed on the copperplate plan, not by surface-printing; but the use of delicate mechanism enables this to be done with great accuracy and celerity; the bank of France notes are produced from plates, the result of photography, electrotyping, and steel-plate printing. Zincography and lithography are employed by some banks; and also *acierage*, a mode of hardening copper electrotypes with a thin surface of steel.

BANK-NOTES, MANUFACTURE OF (*ante*). The bank-notes of the United States are now manufactured by the government in the treasury department at Washington. The processes of this manufacture are briefly described as follows: The design of the note, including all the lettering and devices thereof, upon a sheet of the required form, being in the hands of the workmen, they first proceed to make the die. A plate of soft, highly polished steel is selected, and upon it is sketched the design, or such portions of it as are of the same color, if more than one tint is to be used in printing. A separate die is needed for every shade used. This is then carefully engraved. It will be understood that, unlike the method of wood engraving, the lines which take the ink are cut into the plate instead of being raised above its surface. The engraver is limited to such parts of the work as can be done by hand; other portions, such as the scrolls and elaborate tracery, are done entirely by machinery. The principal apparatus used is a complicated piece of mechanism, which actuates a plate to which the steel for the die is attached and caused to press against a diamond point. Perfectly true and delicate lines are thus cut into the metal, making figures technically termed "cycloid rosettes." The machine, in theory, somewhat resembles a kaleidoscope, as it requires to be set by accurate pointers and dials to some special figure, which, when the combination is changed, can never be reproduced. One of these instruments is in use, and its work, together with that of the geometrical lathes, can be readily recognized on the national currency.

The die being complete, is ready for the transfer process. Postage stamps, for instance, are made in sheets of two hundred, so that the die must be transferred that number of times on a single plate. It is first case-hardened and then put, face up, in a press which is made with a combination of levers actuated by the foot, so as to give the tremendous pressure of twenty-one tons on a single line. A cylinder or "roll" of soft steel is, by careful gauging, placed so as to rest directly over the face of the die, and, at the same time, is so arranged as to revolve easily along its surface even when under the full weight. The pressure is then applied, with the result of forcing the soft steel of the roll into the lines of the engraving, so that when complete, the periphery of the cylinder shows an exact reproduction of the face of the die, only the lines sunk on the die are now raised on the roll. Next, the cylinder is case-hardened. Then the plate—soft steel again—to be used for the final printing is placed in the press and the roll is arranged above it. Now the cylinder leaves its impression on the plate, the hard steel of the raised lines cutting deep into the surface, so that a precise duplicate of the original die is obtained. This is repeated as many times as there are to be repetitions of the stamp or note on the single plate, which is then ready for use.

The ink for printing is made on the spot. In a large room are ten or a dozen paint mills, which are busily grinding the colors and oil together. Two large ones are filled with green ink, another with vermilion, while others are making blue, red, and other tinted inks. Nothing but the finest color and the best boiled linseed oil is here used. We now pass to the paper room, where the paper is received directly from the government, cut in sheets of the required form. The fractional currency and larger notes are made of a peculiar material containing colored fibers. The paper for postage stamps is made of the best linen. It is of short fiber, very fine, and extremely strong. The sheets on which currency is to be printed are counted as soon as received, and the result reported for verification. They are placed in heaps, marked off in sets of 100 and 1000. When issued for printing, the workman receiving them has to present an order signed by the superintendent. They are then charged against him in his pass-book, when he carries them away to be damped, by simply wrapping them in wet cloths. The presses

used are simply cylinders moved by long-handled levers, and are each attended by three men and a girl. The plate rests upon a small iron box warmed underneath by gas flames. A workman using a plate-printer's roller rapidly covers the plate with ink and passes it to another operative at his side, who wipes it with a soft cotton cloth, and then polishes with the palm of his hand covered with whiting, thus removing the ink from its surface, but not from the engraved lines which remain filled. This done, the plate is placed, face up, in the press. The girl stands ready with a sheet of damp paper which she carefully lays upon the plate. The pressman turns the levers, the cylinder revolves, the plate passes under it, and the paper is removed bearing a perfect impression. As soon as a printer has completed the work assigned to him, he hands it, made up in "books" of 100 impressions, each sheet inclosed between two others of brown paper, to a clerk. He is then credited with his delivery, spoiled sheets being counted the same as perfect ones, so that if his return is correct his debit account on his passbook, which is kept in a different apartment and by other employés, is thus balanced. The finished impressions are now carefully counted and inspected. The spoiled ones are removed and sent to the proper agents to be burnt, while the others are hung in the drying room. This apartment is heated by steam-pipes, and the paper is suspended by wires, for a day or two, until perfectly dry. Then the brown paper is removed, and the sheets, packed between leaves of press board, are subjected to the action of a powerful hydraulic press. They are then once more inspected and counted.

BANKRUPTCY. See INSOLVENCY.

BANKS, a co. in n.e. Georgia, on Broad river; 250 sq.m.; pop. '80, 7,337—9,140 colored. Productions, wheat, corn, cotton, and sweet potatoes. Co. seat Homer.

BANKS, in navigation, are elevations of the bottom of the sea; when tolerably smooth at the top, they constitute *shallows, shoals,* and *flats;* but when rocky, they become *reefs, ridges, keys,* etc. Pilots and captains of ships require to be intimately acquainted with the B. along their route; and a chart, if properly prepared, always defines them by means of small dots, if sands, and small crosses, if rocky. In war-time, small vessels often escape capture by running into shallows where larger vessels dare not follow them. The Newfoundland and the Bahama B. are well-known examples of this kind of sea-bottom.

BANKS, Sir JOSEPH, a zealous naturalist, was b., according to some accounts, at Revesby Abbey, in Lincolnshire, according too thers, in London, in Jan., 1743, and d. June 19, 1820. He was descended from a family of Swedish origin, which had been settled in England for about 200 years. To this family belongs also John Banks, who made his name known as a writer of tragedies, in the latter half of the 17th century. B. was educated at Eton and Oxford. In 1763, he made a voyage to Newfoundland and Labrador, collecting plants; and from 1768 to 1771, he sailed with Cook round the world in the capacity of naturalist, and wrote the botanical descriptions for the first voyages. In the year 1772, he visited the Hebrides and Iceland, whence he brought back a rich treasure of specimens for his studies in natural history. Before this voyage, Staffa was hardly known beyond its immediate vicinity. It was carefully examined by B., and through him its wonders were made known to the public. In 1777, he was elected president of the royal society, an office which he held for 42 years; and in 1781 he was created a baronet. He deserves particular credit for founding and managing the African association; and the colony of Botany bay owed its origin mainly to him. Through his efforts, the bread-fruit tree was transferred from Otaheite to the West Indies, and the mango from Bengal, as well as many of the fruits of Ceylon and Persia. Many naturalists and travelers—Blumenthal, Hornemann, Burckhardt, Mungo Park, and others—were indebted to him for zealous and disinterested assistance in their labors. During the French war, B. did much to alleviate the sufferings of all captive men of science, and used his influence with government to procure the restoration of their papers. Cuvier, in his *éloge* on him before the French academy of science, states that no less than ten times had collections, captured by the English, been restored to the Jardin du Roi at Paris through the instrumentality of Banks. No man of science appealed to him in vain for pecuniary assistance; and his splendid library of natural history was at the service of those who desired to consult it. With the exception of articles in magazines, and contributions to the publications of learned societies, especially to the *Philosophical Transactions,* B. has written nothing but two small works—*A Short Account of the Causes of the Diseases in Corn called Blight, Mildew, and Rust,* which was printed for his friends in 1803, and for the public in 1805; and *Circumstances Relative to Merino Sheep* (London, 1809). He left a valuable library, of which an excellent catalogue was made by his friend Dryander; and a rich collection of specimens in natural history, both of which he bequeathed to the British museum.

BANKS, SAVINGS. See SAVINGS-BANKS.

BANKS, THOMAS, an eminent English sculptor, b. in Lambeth in Dec., 1735. B. was apprenticed to a landscape gardener and architect, but he soon abandoned these practical arts for the more imaginative one of sculpture. In 1770, B. was a successful candidate for the gold prize of the royal academy, established two years before. In 1772, with an allowance of £50 a year from the academy for three years, he went to Rome to

study the masterpieces of art there. After a residence of several years in Rome, during which he exhibited two of his finest works, "Caractacus Pleading before Claudius," and "Psyche and the Butterfly," and having gained much fame but little profit, he returned to England. Here his refined imaginative style was little appreciated in comparison with the popular but inferior performances of some of his contemporaries; and after two years, he went to Russia, where he was well received by the empress Catharine, who purchased his Psyche, and gave him a commission for a group called "Armed Neutrality." Having executed this, he returned to England, where he completed perhaps his finest work, "The Mourning Achilles," now in the British institution. B. now received several commissions, and was elected a member of the royal academy. The monuments of Sir Eyre Coote in Westminster abbey, and of captains Burgess and Westcott in St. Paul's cathedral, were among his last works. He died Feb. 2, 1805. It was in purely imaginative works that B. most excelled; in practical subjects, his introduction of the ideal was incongruous and inartistic, rendering them far less valuable than those of some of his rivals.

BANKS, NATHANIEL PRENTISS, b. Mass., 1816, a statesman and general. He learned the trade of a machinist, studying in leisure hours; edited a newspaper in Waltham, and another in Lowell, was admitted to the bar; elected to the legislature in 1849, and made speaker in 1851. In 1852, he was chosen a member of congress. In 1853, he was president of the convention to revise the constitution of the state; in 1854, re-elected to congress, and chosen speaker of the house of representatives after the longest contest ever known (congress met Dec. 3, 1855, and the speaker was not elected until the 133d ballot, Feb. 2, 1856), he was again chosen to congress in 1856; and governor of Massachusetts 1857–59. He was commissioned maj.-gen. in the civil war, and was in active service until its close. After the war he was chosen and re-chosen to congress, until 1872.

BANKSIA, a genus of Australian shrubs of the natural order *proteaceæ* (q.v.), named in honor of Sir Joseph Banks. A few of the species become small trees. They have hard dry leaves, generally white or very pale green beneath, and present a remarkable appearance from the umbellate arrangement of their branches, which bear towards their extremities oblong heads of very numerous flowers. The flowers secrete much honey. Some of the species are now frequent ornaments of greenhouses in Britain. They are abundant in all parts of Australia, forming, indeed, a characteristic feature of its vegetation, and are called honeysuckle trees. *B. grandis*, found at Swan river, exceeds all the rest of the genus in size, attaining a height of 50 feet.

BANKSIA, several genera of plants named after Sir Joseph Banks, but only one properly so—one of the family of proteaceæ, named B., by Linnæus. They are natives of Australia, of conspicuous and beautiful forms, with broad hard leaves, which closely cover the branches; flower and fruit in cones, the flowers projecting in spikes.

BANKS LAND, an island in the Arctic ocean, 70 m. to the s.w. of Melville island. It is intersected by the parallel of 74° n., and by the meridian of 116° west.

BANN, the name of two rivers in the n.e. of Ireland; the one, the upper B., flowing into, and the other, the lower B., out of Loch Neagh. The upper B. rises on the n. side of the Mourne mountains, in the s. of Downshire, and runs 25 m. n.n.w. through the counties of Down and Armagh, successively in a granite, silurian, trap, and tertiary basin, into the s. side of Lough Neagh. It passes Banbridge, Gilford, and Portadown. At the latter place the Newry canal joins it. The lower B., strictly the continuation of the upper, issues from the n.w. corner of Lough Neagh, and flows 40 m. n.n.w., through Lough Beg, and dividing the counties of Antrim and Londonderry. It runs past Portglenone and Coleraine, into the Atlantic ocean 4 m. s.w. of Portrush. One m. above Coleraine it falls over a ledge of rock 13 ft. high. It bears the surplus waters of Lough Neagh to the ocean, and has important salmon and eel-fisheries. Vessels of 200 tons can reach Coleraine by the river, 4 m. from the ocean.

BANNACKS, BONNACKS, or PAUNAQUES, an Indian tribe of the Shoshone family, frequenting the Yellowstone region, and the territory between the Rocky mountains and the Sierra Nevada; about 1,000 in number; usually friendly to the whites. The B. are brave and proud, and the men are usually good looking. They speak a dialect of Shoshone.

BANNATYNE CLUB, a literary club deriving its name from George Bannatyne, to whose industry we are indebted for the preservation of much of the Scottish poetry of the 15th and 16th centuries. The B. C. was instituted in Edinburgh in 1823 by Sir Walter Scott, with the assistance chiefly of Mr. David Laing of the Signet library, Mr. Archibald Constable, and Mr. Thomas Thomson. The object of the institution was to print rare works illustrative of Scottish history, topography, poetry, miscellaneous literature, etc., in a uniform and handsome manner, either at the expense of the club, or as the contributions of individual members. As a general rule, the number of copies of each work printed was limited to the number required for distribution among members, but in some instances a few were printed for sale. The club originally consisted of 31 members only, who paid an annual contribution of five guineas; but, owing to the anxiety of many eminent men to become members, the number was gradually extended to 100, where it was definitively fixed, the same annual payment being still required. Its first president

was Sir Walter Scott, who was succeeded by Mr. Thomas Thomson, and lords Cockburn and Rutherfurd; and its first secretary was Mr. David Laing, who continued to its close to discharge the duties of the office. The club had annual meetings in Dec., which were of a very convivial character, so far as can be judged from an account of their first meeting published in the *Edinburgh Literary Gazette* of Feb., 1834—afterwards reprinted by the club itself—which suggestively says that the *Bannatyne Garland*, No. 1, a song composed by one of the members, was sung "to the tune of *Four Bottles more.*" These meetings, however, were given up, and the club itself, which, in 1859, numbered about 80 members, was finally dissolved on the 27th Feb., 1861. Since its commencement it numbered among its members many of the most distinguished Scotsmen, and printed 116 works, some valuable as they are rare, and all bringing high prices at sales.

BANNEKER, BENJAMIN, 1731–1806, a negro mathematician, a native of Maryland. His grandmother, a white woman, taught him reading and writing, and after his 50th year he began to study mathematics with special reference to astronomy. In 1792, he issued an almanac of his own making, and continued the series annually throughout his life. He assisted in fixing the boundary lines of the district of Columbia.

BANNER, a piece of cloth attached to a pole and usually bearing some warlike or heraldic device or national emblem. In this sense B. is a generic term, incuding many species, such as standard, ensign, pennon, flag, etc. Banners have been used from the earliest times and in all countries for the purpose of directing the movements of troops. We read of them constantly in the Old Testament, as in Numbers ii. 2: "Every man of the children of Israel shall camp by his standard, and under the ensign of his father's house." The earliest Roman standard was a bundle of straw fixed to the top of a spear. This was succeeded by figures of animals—the horse, the boar, etc., all of which soon gave place to the eagle, which continued all along to be the chief Roman ensign, and was afterwards assumed by the German and latterly by the French emperors of the Napoleon dynasty. In addition to the eagle each Roman cohort had a B., generally a serpent or dragon woven on a square piece of cloth. The standard of the cavalry was a square piece of cloth expanded on a cross, and it was to this that the term *vexillum* properly applied. Examples of these standards are sculptured on the arch of Constantine at Rome. The top of the staff was also frequently adorned with a figure of Mars or of Victory, and in later times with the head of the reigning emperor. After Constantine embraced Christianity, the cross was substituted for the head of the emperor on the purple B. of Byzantium. Standards were less in use amongst the Greeks than has been usual with warlike nations; but a standard, and sometimes a scarlet flag, was employed as a signal for giving battle. On the rise of chivalry in the middle ages, the ordering of banners, like every other branch of military organization, attained to something like scientific exactitude. From the B.-royal, which bore the national emblems, to the small streamer attached to the lance, with its cross or stripes, there was a regular subordination, each emblem having its place and its meaning. The pennon of the simple knight differed from the square B. of the banneret (q.v.), it being pointed at the ends. In addition to their varieties in size, shape, and color, these banners were distinguished by the emblems which they bore. One of the earliest is the Danish raven, depicted on the standard taken by Alfred, of which Asser mentions the tradition, that "in every battle, wherever that flag went before them, if they (the Danes) were to gain a victory, a live crow would appear flying on the middle of the flag; but if they were doomed to be defeated, it would hang down motionless." Nor did the privilege of carrying banners belong to princes and knights alone; bishops and abbots displayed similar ensigns, which were carried before them in religious processions and under which their retainers fought in their defense. It was to these that the term "Gonfalon," a word as to the origin of which much diversity of opinion exists, was more commonly applied. In place of the heraldic emblems of the knight, the B. of the church and of towns and communes usually bore the effigies of saints. Some banners, however, displayed no ensigns whatever and were known simply by their color. Of this the *oriflamme*, or plain ruddy flag of St. Denis, was a famous example. The celebrated Bayeux tapestry (q.v.) throws considerable light on banners, as well as on other matters connected with the warlike arrangements of the middle ages. Much curious information on this and kindred subjects will be found in Hewitt's *Ancient Armor and Weapons in Europe*. By every warlike people the B. has been regarded as the emblem of national honor, as a palladium for the defense of which the individual warrior was at all times ready to sacrifice his life. From the converse of this feeling banners and flags taken from the enemy have always been regarded as special trophies of victory, and places of honor in churches and public buildings have consequently been assigned them. As to the flags borne by the ships of different nations and the arrangements concerning them in peace and war, see FLAG; as to colors of regiments, see COLORS.

The relation which banners bear to other kinds of flags in their forms and uses will be explained under COLORS, MILITARY; ENSIGN; FLAG; PENDANT, etc.

Banner displayed is the term used by heralds to describe a B. open and flying.

BANNERET, a higher grade of knighthood conferred by the sovereign for some heroic act performed in the field, and so called because the pennon of the knight was then exchanged for the banner—a proceeding which was effected by the very simple

means of rending the points from the pennon. The first B. in England is said by Froissart to have been made by king Edward I., and the last time the honor was conferred was by Charles I. after the battle of Edgehill, the recipient being an individual who rejoiced in the familiar name of John Smith. The ceremony of the creation of a knight-B. must have been very impressive to persons filled with the ideas which were prevalent in the ages of chivalry. The king, or his general, at the head of his army, drawn up in order of battle after a victory under the royal banner displayed, attended by all the officers and nobility of the court, received the B. elect, who was not necessarily a knight previously, led between two knights of note or other men famous in arms, carrying his pennon in his hand, the heralds walking before him and proclaiming his valiant achievements, for which he deserved to be made a knight-B., and to display his banner in the field. The king, or general, then said to him: "Advance, Banneret!" (*advances toy banneret*), and caused the point of his pennon to be torn off. The new knight, with the trumpeters sounding before him and the nobility and officers bearing him company, was sent back to his tent, where a noble entertainment was provided by the king. Some attempts have been made to revive the title in recent times, as when George III., at a review of the navy at Portsmouth in 1773, conferred it on admiral Pye and several other officers.

BANNOCK, a cake of home-made bread, common in the country parts of Scotland, but now less so than formerly. It is usually composed of pease-meal or pease and barley-meal mixed; prepared without any leaven, it is baked on a circular plate of iron called a girdle. When made of mixed meal it is called a mashlum bannock. "Bannocks of barley-meal" form the theme of a popular Scottish song. A superior kind of B., called a Selkirk B., from the place where it is made, resembles the finer and lighter species of tea-cakes prepared by bakers. The word B. is from the Gaelic *bonach*, a cake. In the w. of Scotland it is pronounced *bunnock*. There is an amusing fairy-tale called *The Story of the Wee* (little) *Bunnock*. The B. is doubtless of great antiquity, being, in fact, the primitive cake, only varied in material, of every country.

BANNOCKBURN, a village in the e. of Stirlingshire, 3 m. s.s.e. of Stirling, on the Bannock rivulet, which falls a few miles below this into the Forth. Near this was fought the great battle of B. on Monday, 24th June, 1314. Robert Bruce, with 30,000 Scotch, gained a signal victory over Edward II. with 100,000 English, and secured his throne and the independence of Scotland. The English are said to have lost 30,000, and the Scotch 8000 men. The "bore stone," on which Bruce is said to have fixed his standard on that eventful day, is still to be seen on an eminence near the scene of the fight. On the s.e. of the field of B., at Sauchie Burn, James III. was defeated in 1488 by his rebellious subjects and assassinated after the battle in a mill where he had taken refuge. B. is now an important seat of the woolen manufactures, especially those of tartans and carpets. It has long supplied the tartan worn by the highland regiments. Tanning is carried on to some extent and the neighboring villages are noted for the manufacture of nails. Coal abounds in the vicinity. Pop. '71, 2258.

BANNS, or BANS, in the law of England means a proclamation, or public notification, or summons, in which general sense, however, it may be said to have become obsolete. It is now chiefly, if not solely, used in the publication of intended marriages, as to which see next article.

BANNS, or BANS OF MARRIAGE. This is one of three alternative preliminary forms now essential to the legal celebration of marriage in England. The other two are marriage by license and marriage by a registrar's certificate. B. of M., like many of our ecclesiastical regulations, has its origin in the ancient practice of the Roman Catholic church, which our reformers wisely refrained from abolishing. By the publication of these B. is meant the legal proclamation or notification within the parish, district, or chapelry, and in the proper church or chapel, of the names and descriptions of the persons who intend to be there married; the notoriety of the solemn act, so that all who have objections to the marriage may be enabled to state them in time. According to the old English canon law, the publication of B. might be made on *holidays*; but a change was made to *Sundays* by the first important marriage act, the 26 Geo. II. c. 33; and although that act was afterwards superseded by the 4 Geo. IV. c. 76, the regulation as to Sundays has been since continued. Seven days notice at least must be given to the clergyman before publication of bans. The other acts in force are the 6 and 7 Will. IV. c. 85, the 1 Vic. c. 22, the 3 and 4 Vic. c. 72, and the 19 and 20 Vic. c. 119. The law, as contained in these acts of parliament, is as follows: By the 4 Geo. IV. c. 76, s. 2, it is enacted that all B. of matrimony shall be published in audible manner, according to the rubric prefixed to the marriage service in the *Book of Common Prayer*, upon three Sundays preceding the ceremony, during the time of morning-service, or of evening service (if on the day of publication there shall be no morning-service) immediately after the second lesson. The rubric referred to is in the following terms: "I publish the banns of marriage between M. of —— and N. of ——. If any of you know cause or just impediment why these persons should not be joined together in holy matrimony, ye are to declare it. This is the first [second, or third] time of asking." By the 22d section of the same act, all marriages celebrated without such publication of B., or without license (or now, under the 6 and 7 Will. IV. c. 85, s. 42, without a registrar's certificate),

are declared to be null and void. By the 26th section of the last mentioned act, the bishop, with consent of the patron and incumbent, may license chapels for the celebration of marriages in popular places; and by the 33d section of the 1 Vic. c. 22. B. may be published in such chapels. By section 9 of the 4 Geo. IV. c. 76, it is provided, that if the marriage be not celebrated within three months after publication of B., the marriage shall not take place until the B. shall have been republished on three several Sundays, unless it be a marriage by license, or now, by certificate, which two latter alternatives, however, must also be availed of within the three months. It only remains to be added on the law, as contained in these marriage acts, that by section 8 of the last of them, the 19 and 20 Vic. c. 119, it is provided, that in every case in which one of the parties intending marriage without license shall dwell in Scotland, a certificate of proclamation of B. in Scotland, by the session-clerk or by the registrar of the district or parish in which such proclamation shall have been made, shall, when produced to any person duly authorized under the provision of this act to solemnize a marriage, be as valid and effectual for authorizing such person to solemnize such marriage as the production of a certificate for marriage of a superintendent register of a district in England would be, in reference to a party resident within such district.

The purpose of the law is to secure public knowledge of intended marriages, and therefore, although the 4 Geo. IV., following in this respect the 26 Geo. II., declares that marriages shall be void without publication of B. (where, of course, that is the chosen preliminary), it is not necessary that such publication should be made in the real baptismal names of both or either of the parties; it is sufficient that the B. be published in the names by which the parties are *known*, or either of them. Nay, it even appears that where the baptismal names have been discovered, having been previously concealed or unknown, it is better, if not necessary, that publication should be made in the names by which the parties are familiarly known in the district, by which, indeed, they may be said to be known to the world. There are numerous cases decided in England from which such doctrine necessarily follows. As the publication of banns invites people to object, if the parent or guardian express dissent, it is the duty of the clergyman, when such objections are offered, to proceed no further; and if he, notwithstanding, marry the parties, he will be liable to severe penalties by the ecclesiastical law, though he will not be liable to an indictment. Again, on the other hand, if he refuse, without cause, to perform the marriage, he is liable to an action. It has also been decided, that a fraudulent knowledge of a wrong name in the publication of B. will not void the marriage, unless the fraud should be on both sides.

In Scotland, B. have the same Roman Catholic origin as in England. Indeed, Mr. Erskine, one of the most authoritative Scotch legal writers, gives it as his opinion, that the Scotch borrowed the practice from the decrees of the *Council of Trent;* but a recent able writer (see *Fraser's Domestic Relations*, vol. i. p. 113) considers this opinion erroneous, and shows that B. were first sanctioned in Scotland by councils which were held in that country long before the Council of Trent. After the reformation in Scotland, the practice of proclaiming B., as the phrase is in that country, was continued. They are described in the Scotch act 1661, c. 34, "as a part of the laudable order and constitution of the kirk;" and they have since been mentioned in various acts of parliament applicable to Scotland, such as the 10 Anne, c. 7, and 4 and 5 Will. IV. c. 28. By the first of these acts, the privilege of publicly celebrating marriage was extended to the Scotch *Episcopalian* clergy, but with a proviso that the B. should be duly published three Lord's days, not only in the Episcopal churches which the parties frequent, but also in the parish church or churches. Should the parish minister, however, neglect or refuse to publish the B. of such parties, the act declares that it shall be sufficient to do so in any Episcopal congregation alone. The 4 Will. IV. c. 28, put other dissenting bodies in Scotland in the same position as the Episcopal church there. There is one other regulation of the Scotch law on this subject which is deserving of notice for popular information—namely, that when both of the parties have their *domicile* (q. v.) within Scotland, and enter into marriage in England or Ireland, they must have their B. proclaimed in the parish of their domicile in Scotland, otherwise they are liable to the penalties of clandestine marriage. By the marriage notice act, 1878, marriage certificates in Scotland are also issued by the district registrars, after seven days' publication, to persons resident for fifteen days in the district; the fee for registry is 1*s.* 6*d.*

The Scotch law differs from the English in regard to the effect of non-publication of banns. In England, in some cases, the consequence is to render the marriage absolutely void. In Scotland, however, marriage, without proclamation of B., is valid; but in such case the parties, celebrator, and witnesses are liable in the above penalties. See MARRIAGE, SPECIAL LICENSE, REGISTRATION OR BIRTHS, DEATHS, AND MARRIAGES.

BANQUETTE, in fortification, is a raised ledge or step inside the parapet of a rampart, of such a height that musketeers, when standing on it, may be able to fire over the crest of the parapet without too much exposure to the enemy. It is about four ft. wide, and four or four and a-half ft. below the crest. The musketeers ascend to it from the rampart either by a few steps or by a sloping path.

BANQUO, a Scotch warrior of the 11th c., the progenitor of the royal house of Stuart. In 1066, he joined Macbeth in a conspiracy against king Duncan, but was treacherously

slain by his confederate. Shakespeare does not mention him as a conspirator, but only as Macbeth's victim.

BANSHEE. See BENSHIE, *ante*.

BANSWARRA, a Rajpoot state in the w. of Malwa, bordering on Guzerat. It extends from n. lat. 23° 10′ to 23° 48′, and from e. long. 74° 2′ to 74° 41′, and has an area of 1500 sq.miles. The pop. is supposed to be about 150,000. This state was dependent on the empire of Delhi until the ascendency of the Mahrattas, by whom it was fearfully oppressed. In 1812, the ruler made overtures to the British government, offering to become tributary on condition of protection; and an arrangement to this effect was concluded in 1818.—The capital, also called B., is on the route from Mhow to Deesa, 123 m. n.w. from Mhow. The majority of the inhabitants are Hindus, but the Mussulmans are also pretty numerous. The palace of the Rawul, or chief, is a large, turreted, battlemented building, on a rising ground overlooking the town, near a beautiful tank, overhung with trees.

BANTAM', a seaport, now decayed, in a residency of the same name, which forms the w. end of Java. It is 40 m. to the w. of Batavia, being in lat. 6° 2′ s., and long. 106° 11′ east. It was founded by the Dutch in 1602, being their earliest establishment in the island. Pop. of residency, 607,400.

BANTAM FOWL, a well-known variety of the common domestic fowl (q.v.), originally brought from the East Indies, and supposed to derive its name from Bantam, in Java. It is remarkable for small size, being only about a pound in weight, and for a disposition more courageous and pugnacious than even that of a game-cock. A bantam-cock will drive to a respectable distance great dunghill-cocks five times its weight, and has been described as "a beautiful example of a great soul in a little body." There are several subvarieties of the bantam. Most of them have the legs much feathered. The flesh and eggs are good, although the eggs are of course small; and the bantam lays well in winter.

BANTENG, *Bos Banteng* or *B. Sondaicus*, a species of ox (q.v.), a native of Java and Borneo, which, in color, shape, horns, and want of dewlap, bears some resemblance to the gaur (q.v.) of India, "but in the skeleton of the gaur, the sacrum consists of 5 vertebræ, and the tail of 19, while in the skeleton of the B., the sacrum consists of but 4 vertebræ, and the tail of 18." The B. is black, with white legs. The hair is short and sleek, the limbs slender. The muzzle is sharp. The back rises into a high arch immediately behind the neck. The B. inhabits forests, and has been generally described as untamable.

BANTING SYSTEM. See OBESITY.

BANTRY, a seaport t. in the s.w. of Cork co., Ireland, in a cove opposite Whiddy isle, at the head of B. bay, and 44 m. w.s.w. of Cork. The two chief streets converge into an open space towards the sea, and mountains, 933 ft. high, rise behind the town. The chief trade is the export of agricultural produce. A little fishing is carried on. In last century, there was an extensive pilchard-fishery here; but the pilchard has now deserted the coast. Many tourists resort to B. in summer. Pop. '71, 2830.

BANTRY BAY, a deep inlet in the s.w. extremity of Ireland, between Crow point and Sheep's Head point, in Cork co. It is 25 m. long, running e.n.e., with a breadth of 3 to 5 miles. It is one of the finest harbors in Europe, affording safe and commodious anchorage for ships of all sizes. Near the entrance on the n. side is a fine large sheltered harbor, formed by Bear island, with a safe passage on both sides. At the head of the bay are two harbors: the one to the s., or the landlocked roadstead of B. harbor, is formed by Whiddy isle, opposite B. town; the other to the n., or Glengariff harbor, is also sheltered by an island, but is small, and narrow at the entrance. The coast around B. B. is rocky and high, consisting of Devonian strata, and exhibiting some of the finest scenery in the kingdom. On the n. side, 17 m. w. of B. town, is the great cataract of Hungry hill, where 3 lakes, at the heights of 1011, 1126, and 1360 ft. above the sea, discharge their waters, by almost continuous cascades, into Adrigoole creek. Near the opening of B. B. a skirmish took place, in 1689, between a small English fleet under admiral Herbert (afterwards lord Torrington), and the French fleet, which conveyed James II. to Kinsale. Several ships of the French invading expedition under gen. Hoche anchored here in 1796.

BANXRING, *Tupaia*, a genus of insectivorous quadrupeds, remarkably differing from the other *insectivora* (q.v.) in their habits, as they climb trees with the agility of lemurs or squirrels. They are also remarkable for their very elongated muzzle. They have soft glistening fur, and a long bushy tail. The few species known are all natives of the Indian archipelago.

BAN'YA (NAGY), or NEU'STADT, a t. of Hungary, province Szathmar, with a royal mint, and productive gold and silver mines. Pop. '69, 9082.

BAN'YAN, or BA'NIAN, *ficus Indica*, a tree, native of India, remarkable for its vast rooting branches. It is a species of fig (q.v.); has ovate, heart-shaped, entire leaves, about 5 or 6 in. long; and produces a fruit of a rich scarlet color, not larger than a cherry, growing in pairs from the axils of the leaves. The branches send shoots down

wards, which, when they have rooted, become stems, the tree in this manner spreading over a great surface, and enduring for many ages. One has been described as having no fewer than 350 stems, equal to large oaks, and more than 3000 smaller ones, covering a space sufficient to contain 7000 persons. The branches are usually covered with monkeys, birds, and enormous bats. The monkeys eat both fruit and leaves. The vegetation of the B. seldom begins on the ground. The seeds are deposited by birds in the crowns of palms, and send down roots which embrace and eventually kill the palm. As the B. gets old, it breaks up into separate masses, the original trunk decaying, and the props becoming separate trunks of the different portions. The wood of the B. is light, porous, and of no value. The bark is regarded by the Hindoo physicians as a powerful tonic, and is administered in diabetes. The white glutinous juice is used to relieve tooth-ache, and also as an application to the soles of the feet when inflamed. Bird-lime is also made from it. Gum-lac is obtained in abundance from the B.-tree. The B.-tree is beautifully described by Southey in his poem, *The Curse of Kehama*.

BANYULS-SUR-MER, a t. of France in the Pyrénées orientales, with a fishing-port on the Mediterranean. The celebrated wines of Grenache and Rancio are produced in this district. Near the town are 4 old towers, one of which marks the division between France and Spain. B. was the immediate scene of many encounters between the French republicans and the Spaniards during the first French revolution. Pop. '76, 2277.

BANYUWAN'GY, or BANJOUVAN'GY, an important seaport t. and military post belonging to the Dutch, on the e. coast of Java, capital of district of same name, which has a pop. of 45,000.

BANZ, a Benedictine abbey in upper Franconia, near Lichtenfels, on the Main; founded in the 11th c., and celebrated for the superior culture of its monks. During the peasant's war in the 16th c., the abbey was destroyed, but immediately restored, again destroyed in the thirty years' war, and again restored. In 1802, it was broken up, the books and collections were scattered among German institutions, and the building became the summer residence of the king of Bavaria.

BA'OBAB. See ADANSONIA.

BAPAUME, a fortified t. of France, department of Pas-de-Calais. A portion of the allied troops advanced to this place after compelling the French to abandon their fortified position, and to retreat behind the Scarpe, in Aug., 1793. Pop. '76, 3190.

BAPH'OMET is the name of a mysterious symbol, which was in use among the templars. According to the oldest and most probable interpretation, the word is a corruption of Mahomet, to whose faith the members of the order were accused of having a leaning. The symbol consisted of a small human figure cut out of stone, having two heads, male and female, with the rest of the body purely feminine. It was environed with serpents, and astronomical attributes, and furnished with inscriptions for the most part in Arabic. Specimens are to be found in the archæological collections of Vienna and Weimar. Hammer, however, in his *Fundgruben des Orients*, derives B. from Gr. *baphè*, baptism; and *metis*, council or wisdom. He charges the knights with a depraved Gnosticism, and makes the word signify the baptism of wisdom—the baptism of fire; in short, the Gnostic baptism—a species of spiritual illumination, which, however, was interpreted sensually by later Gnostics, such as the Ophites (an Egyptian sect of the 11th c.), to whose licentious practices he declares them to have been addicted. But this explanation is generally discredited.

BAPTISM (Gr. *bapto*, to dip or wash, or to stain with a liquid), one of the sacraments (q.v.) of the Christian church, deriving its name from the outward rite of washing with water, which forms an essential part of it. B. is almost universally acknowledged among Christians as a sacrament, and is referred to the authority of Christ himself, whose express commandment is recorded in the gospels (Matt. xxviii. 19; Mark xvi. 16). B. is frequently mentioned in the New Testament as a divine ordinance.

The name and the rite were not, however, altogether new when the ordinance was instituted by Christ. Religious meanings were early attached to washings with water, both by heathens and Jews; they were among the ordinances of the Jewish law; and it is not necessary to go beyond that law to find the origin of the custom of washing or *baptizing* proselytes upon their admission into the Jewish church. Washing with water was requisite for the removal of ceremonial uncleanness, and every proselyte must have been regarded as, prior to his admission into the Jewish church, ceremonially unclean. John the Baptist baptized not proselytes upon their renouncing heathenism and entering the Jewish church, but those who, by birth and descent, were members of it, to indicate the necessity of a purification of the soul from sin—a spiritual, and not a mere outward change.

One of the most important of the controversies which have agitated the Christian church as to B., is that concerning the proper subjects of B., whether adults only who profess faith in Christ are to be baptized, or if this ordinance is to be administered to their infants also. See BAPTISTS, and BAPTISM, INFANT. The B. of adults was certainly more frequent in the apostolic age than it has ordinarily been where the B. of infants has prevailed; for which an obvious cause presents itself in the fact, that the first members of churches were converts from Judaism or from heathenism. It is, however, gen-

erally held by those who advocate the B. of infants, that it was the practice of the apostles and of the church of the apostolic age to baptize the infants of Christians; which, on the other hand, is as stoutly denied, and infant B. is alleged to have crept in along with other corruptions. For neither opinion can any positive historical proof be adduced, the arguments on both sides being purely inferential.

It is admitted, on all hands, that at an early period in the history of the church, B. was administered to infants, although, according to Neander, even after "it had been set forth as an apostolic institution, its introduction into the general practice of the church was but slow." He finds "the first trace" of it in Irenæus. It was opposed by Tertullian about the end of the 2d c.; and was advocated by Cyprian, and acknowledged as an apostolic institution in the North African church and in the Alexandrian and Syro-Persian churches in the 3d c.; but it is not until the 5th c. that it became fully established as the general practice of the Christian church. It has unquestionably continued to be the general practice from that period to the present day; feebly opposed by some of the sects of the middle ages, and more vigorously by some of those who have adopted the general principles of the reformation. See BAPTISTS.

Both the practice of infant B., and the neglect of it in the early ages of the church, were connected with particular views of religious doctrine, and of the nature and purpose of B. itself. The prevalence of the Augustinian doctrine of original sin is generally regarded as a principal cause of the prevalence of infant B.; but Pelagius, whilst opposing that doctrine, maintained the necessity of infant B., apparently upon the ground that the kingdom of heaven can be attained by human beings only through God's grace. No little influence in favor of infant B. must be ascribed to the growing belief of the absolute necessity of B. to salvation, and of a sort of mysterious efficacy in the rite itself. It is certain, on the other hand, that the belief in the forgiveness of sins in B. led to a practice of deferring it as long as possible, that all sins might be blotted out at once; thus the emperor Constantine the great was baptized only a short time before his death. The approach of a war or pestilence caused many to rush forward in haste to be baptized, who had previously delayed.

Two modes of B. are practiced: by immersion or dipping, and by aspersion or sprinkling, concerning which there has been much controversy in the early period of the church's history, as well as in recent times. Affusion, or pouring, the common practice of the Church of Rome, may be regarded as essentially the same with sprinkling. The advocates of sprinkling universally admit the validity of B. administered in the other mode, but the advocates of dipping generally refuse to acknowledge that B. by sprinkling can be true Christian baptism. The opponents of infant B., almost without exception, insist upon immersion; whilst aspersion or affusion of water is general, except in the eastern churches, wherever the B. of infants prevails. The argument upon which Baptists depend most of all is from the word B., and the verb *baptizo*, to baptize, which also, in classic Greek, signifies to immerse. On the other side, it is contended that a strict limitation to this sense does not well accord with its character as a "frequentative" form of *bapto;* and instances are adduced from the New Testament itself, in which this signification cannot easily be attached either to the noun or to the verb, as 1 Cor. x. 2, where Paul says that the Israelites were "baptized unto Moses in the cloud and in the sea;" and Heb. ix. 10, Mark vii. 4, and Luke xi. 38, where both verb and noun are employed concerning the *washings* of the Jews, and the noun even of their washing of "cups, and pots, brazen vessels, and of tables."—To the argument in favor of immersion, derived from the phrases employed when B. is mentioned in Scripture, as when we are told (Matt. iii. 6) that John the Baptist baptized "in Jordan," that our Lord after his B. (Matt. iii. 16) "went up out of the water," that Philip and the Ethiopian eunuch (Acts viii. 38) "went down both into the water;" it is replied that all the passages of this description, even if their meaning were certainly as precise and full as Baptists suppose it to be, are insufficient to sustain the weight of the conclusion as to the necessity of a particular mode of B.; that, however, it is far from being clear that these passages must be interpreted or the meaning of the Greek prepositions so strictly defined as the argument requires; and further, that there are instances mentioned in Scripture which afford a presumptive argument in favor of another mode of B., as where we are told of great numbers added to the church in one day; whilst we have nowhere any intimation of converts being led to any pond or river to be baptized. To the argument drawn from the language of Paul in Rom. vi. 4, Col. ii. 12 (see BAPTISTS), it is replied that it depends upon a fanciful interpretation of these texts.—According to most of the advocates of B. by sprinkling, the great error of their opponents is that of attaching too much importance to the question of the mode of baptism.

It is, however, indisputable that in the primitive church the ordinary mode of B. was by immersion, in order to which *baptisteries* (q.v.) began to be erected in the 3d, perhaps in the 2d c., and the sexes were usually baptized apart. But B. was administered to sick persons by sprinkling; although doubts as to the complete efficacy of this *clinic* (sick) B. were evidently prevalent in the time of Cyprian (middle of 3d c.). B. by sprinkling gradually became more prevalent; but the dispute concerning the mode of B. became one of the irreconcilable differences between the eastern and western churches, the former generally adhering to the practice of immersion, whilst the latter adopted mere pouring of water on the head, or sprinkling on the face, which practice has

generally prevailed since the 13th c.; but not universally, for it was the ordinary practice in England before the reformation to immerse infants, and the *fonts* (q.v.) in the churches were made large enough for this purpose. This continued also to be the practice till the reign of Elizabeth; and the change which then took place is ascribed to the English divines who had sought refuge in Geneva, and other places of the continent, during the reign of Mary. To this day the rubric of the church of England requires, that if the godfathers and godmothers "shall certify him that the child may well endure it," the officiating priest "shall dip it in the water discreetly and warily;" and it is only, "if they shall certify that the child is weak," that "it shall suffice to pour water upon it," which, however, or sprinkling, is now the ordinary practice.

B. was accompanied, from an early period in the history of the church, with various forms and ceremonies, besides the simple rite of washing with water and the pronouncing of the formula which declares it to be "in the name of the Father, and of the Son, and of the Holy Ghost." These ceremonies are almost all retained in the church of Rome, and also generally in the oriental churches, but have been entirely or almost entirely laid aside by Protestants. The church of England retains the sign of the cross made upon the forehead after B., but the other Protestant churches in Britain reject it. It was an ancient custom that the *catechumens*, as candidates for B. were called whilst receiving instruction with a view to that sacrament, when they were to be baptized, publicly made a profession of their faith and a renunciation of the devil and all his works. The profession of faith is still retained by Protestant churches as the formal ground of the administration of B.; the renunciation of the devil and his works is required by the church of England of the person baptized, if an adult, or of the *sponsors* or "sureties" of a child.—Sponsors (q.v.) were early admitted to answer for those who could not answer for themselves, and particularly for infants. The belief in the absolute necessity of B. to salvation led even to B. of the dead among the Montanists in Africa, in which sponsorship was also introduced. Presbyterian and independent churches generally reject all sponsorship, and regard the profession made by parents as simply a profession of their own faith, which entitles their infants to baptism. The ancient practice of exorcism (q.v.) immediately before B. has been rejected as superstitious by almost all Protestant churches; as have also that of immersing three times (*trine immersion*), or sprinkling three times, with reference to the three persons of the Godhead—that of breathing upon the baptized person, "to signify the expulsion of the devil, and to symbolize the gift of the Holy Spirit—that of anointing with oil (*chrism*, q.v.) to symbolize the same gift, or to indicate that the baptized person is ready, as a wrestler in the ancient games, to fight the good fight of faith—that of giving him milk and honey, in token of his spiritual youth, and of his reception of spiritual gifts and graces—that of putting a little salt into his mouth, to signify the wisdom and taste for heavenly things proper to a Christian—that of touching his nostrils and ears with spittle, to signify that his ears are to be ever open to truth, and that he should ever feel the sweet odor of truth and virtue—and that of clothing him after B. with a white robe (the *chrysome*), in token of the innocence of soul which by B. he was supposed to have acquired. The white robe and the anointing with oil were retained in the church of England for a short time after the Reformation.—The giving of a name in B. (see the article NAMES) is no essential part of it, but is a custom apparently derived from that of the Jews in circumcision (Luke i. 59–63).—The church of Rome prefers the use of holy-water (q.v.) in B., but regards any water as fit for the purpose in case of necessity.—According to an ancient usage, long obsolete, the ordinary administration of B. was limited to the two great festivals of Easter and Whitsuntide.—Whether B. may be administered in private, has been much debated, both in ancient and modern times. The administration of B. in private houses, and not in the presence of a congregation, was one of the things earnestly contended against by the Presbyterians in Scotland in the first half of the 17th c.; their opposition being grounded, not only upon hostility to what they deemed usurpation of authority, but upon the danger of superstitious views of baptism. And apparently upon this latter ground, B. in private houses is also discouraged, even while it is allowed, if there is "great cause and necessity," by the church of England; yet it has become very frequent both in the church of England and among the Presbyterians of Scotland.

Some of the most important questions concerning B. will be most appropriately noticed in the article SACRAMENT, particularly those relating to its place in the Christian system and among the means of grace. The opinions early became prevalent, that forgiveness of sins is obtained in B., and spiritual life begun, and that it is indispensably necessary to salvation—exception being only made, if any was made at all, of the case of believers, adult persons, who desiring B., were prevented from being baptized, and particularly of those who suffered martyrdom, which was generally held to be equivalent to baptism. The church of Rome still owns, as supplying the place of B. by water, these two—B by desire, and B. by blood—i e., in martyrdom.—According to the general doctrine of the Protestant churches, B. is "a sign and seal" of the covenant of grace, representing as a sign the blessings of the covenant, and as a seal, confirming the covenant. As a sign, it is generally held to represent in its rite of washing, the removal both of guilt and corruption, by the blood and by the Spirit of Christ, and so to relate equally to pardon and regeneration, although some have limited its

symbolic reference to regeneration alone. One of the most important points disputed concerning B., is that of baptismal regeneration. See REGENERATION.

Some early Christian sects appear to have rejected B., on grounds somewhat similar to those on which it is rejected by Quakers (q.v.) at the present day, who explain the passages which relate to it symbolically, and insist that a spiritual B. is the only real B. of Christians.—The Socinians also in modern times have maintained that B. is not an ordinance of permanent obligation, but a merely symbolical rite of little importance.

Much controversy has taken place concerning *lay baptism*. Wherever there is a recognized ministry in the church, there is a general agreement in referring the ordinary administration of B. to those who hold this office. It might be expected that the more strongly the necessity of the transmission of *holy orders* by apostolical succession is asserted, the more strongly also would exclusiveness be manifested with regard to the right of the *clergy* to administer B. But this tendency is counteracted by the belief in the necessity of B., or at least of its great importance to the salvation of infants; so that from an early period lay B. was allowed, although not without a struggle, in cases of apprehended danger; and in the church of Rome, this principle is logically carried out to the fullest extent, and even women are authorized to administer B. in cases of necessity. On the same ground, lay B. was at first permitted in the Protestant church of England; but the prevalence of other views led to a kind of formal restriction of the right of administering it to "lawful ministers," although in practice the validity of lay B. is still generally recognized.

Another question much agitated in the church from early times, is that concerning the validity of B. by heretics. The opinion ultimately prevailed, that B. by heretics is valid, except in the case of those who do not baptize in the name of the three Persons of the Godhead. This continues to be the almost universal opinion. Few Protestant theologians hesitate to acknowledge the validity of B. administered in the church of Rome.

The *B. of bells* is a custom supposed to have been introduced about the 10th c., and still retained in the church of Rome. The term *benediction* is sometimes substituted for B.; but the rite itself is very similar to that of B., and is accompanied with many similar ceremonies—"a sort of exorcism," sprinkling with holy-water, anointing "with the oil of catechumens," and "with chrism," a formula of consecration "in the name of the Father, Son, and Holy Ghost," and sometimes also, if not always, the giving of a name to the bell consecrated, and even a kind of sponsorship as by godfathers and godmothers in baptism. This custom has no doubt greatly fostered the notion of an efficacy in the ringing of bells for protection in storms, and for other benefits; indeed, it is expressly avowed that "the bells are blessed to turn off storms and tempests from the faithful."

BAPTISM, INFANT. The chief arguments in favor of infant B. are based upon the proposition that the church is one throughout all changes of dispensation. From this it is argued that as infants were, so they still must be included in the visible church. It is maintained that in all covenants which God has made with men, their children have been included; that the covenant with Abraham was a renewed revelation of the covenant of grace, the temporal promises made to him being connected with the greatest spiritual promises; that circumcision was a seal of the covenant with respect to these, in which the children of Christians have the same interest that Jewish children had; and that B. is a seal of the covenant now as circumcision was, the things to which it has immediate reference being also blessings which children are capable of. It is contended that the arguments in favor of infant salvation derive additional strength from that view of the place of infants in the church according to which they are entitled to baptism. The passages which connect B. with faith are regarded as exclusively relating to adults, like the passages which connect salvation with faith and repentance. In reply to the argument that there is no express command for infant B., it is argued that the state of the case rather demands of those who oppose it the production of an express command against it, without which the general command must be held to include it; the words and actions of our Saviour (Mark x. 14) with respect to children are quoted as confirming the opinion that the place of infants in the church is precisely what it was under the Jewish dispensation; and it is contended that it would have been a very great restriction of privilege in the new dispensation if infants had been excluded from a place which they held before, as entitled to a seal of the covenant, whereas it is evident that the new dispensation is characterized not by restriction but by enlargement of privilege.—Those who hold the doctrine of infant B. are styled Pedobaptists.

The Roman Catholic and Lutheran churches regard the B. of infants as admitting them into the church, and making them members of Christ's body. The reformed (q.v.) churches hold that the children of Christians are included in the visible church from their birth, and therefore entitled to baptism. These are the natural starting-points of very different systems.

BAPTISTERY (Gr. *baptisterion*, a large vase or basin), the name given sometimes to a separate building, sometimes to the portion of the church itself in which the ceremony of baptism was performed. In the latter case, the B. was merely the inclosure containing the font, to be seen in most English churches. According to the earlier arrangements of the Christian church, however, the B. seems usually to have been a

building standing detached from, though in the immediate vicinity of the church to which it appertained. Baptisteries, at first, were either hexagonal or octagonal, but afterwards became polygonal, and even circular. The B. of St. Giovanni in Fonte, at Rome, commonly known as the B. of Constantine, is octagonal, whilst the church of St. Constantia, which was originally a B., is circular.

The celebrated B. of Florence is an octagonal structure, measuring about 100 ft. in diameter. It stands detached from, but in the immediate vicinity of the cathedral. It is built of black and white marble, in the style which Giotto is said to have introduced, and which is still peculiar to Florence. Internally, a gallery, which runs nearly round the whole building, is supported by 16 large granite columns, and the vaulted roof is decorated with mosaics by Andrea Tafi, the pupil of Cimabue. But the magnificent bronze doors, with their beautiful bass-reliefs, are the most remarkable feature of this famous baptistery. The most celebrated of the three doors was executed by Lorenzo Ghiberti, the earliest being the work of Andrea of Pisa. Fifty years were required for their completion; and it is remarkable that the contracts for their execution are still preserved. Next in importance, and of even greater size, is the B. of Pisa. It is circular in form, the diameter measuring 116 feet. Externally, it is divided into three stories, the two under ones being surrounded by columns, of which the upper are smaller and more numerous than the under. The building is raised from the ground on three steps, and terminates in a pear-shaped dome, which is famous for its echo, the sides acting as whispering-galleries. The largest B. ever erected is supposed to have been that of St. Sophia, at Constantinople, which was so spacious as to have served on one occasion for the residence of the emperor Basilicus.

BAPTISTS (sometimes called *Antipedobaptists*, as opposed to *Pedobaptists*, or those who advocate infant baptism*). This denomination of Christians refuse to acknowledge any great name as founder of their sect. They trace their origin to the primitive church itself, and refer to the Acts of the Apostles and their epistles as affording, in their opinion, incontestible evidence that their leading tenets had the sanction of inspiration. When Christianity became corrupted by the rise of Antichrist, they point to the maintenance of their scripture practice among the Cathari and Albigenses and other sects of the middle ages, who, in the midst of surrounding darkness, continued to hold fast the apostolic testimony. They sprung into notice in England under Henry VIII. and Elizabeth. They were persecuted under both reigns, but they received freedom to meet for worship from James II., and complete religious liberty under William III. Ever since, they have diffused their principles extensively in Great Britain and North America; many of their ministers have done good service to the cause of science and literature, and, both as preachers and writers, have taken a position of eminence in society.

The B. hold the plenary inspiration and supreme authority of the Holy Scriptures as a revelation from God; the equal deity of the Son and the Holy Spirit in the unity of the ever blessed Trinity. But, as a condensed view of opinions cannot be expected in this work, it may be as well to state that the denomination are distinguished by almost all the shades of belief which exist in other bodies. They have among them Calvinists both *hyper* and moderate, also high and low Arminians, diverging off in every variety of shade from a common center. The great body of them in Britain and America hold the doctrine of Calvinism in a modified form; that is to say, they maintain the *sufficiency* of the atonement for *all men:* the limitation for which some have pleaded, they consider, lies in its *application* to the sinner by the sovereign grace of God through faith. They maintain the necessity of regeneration and holiness of life as essential to true religion, and that "without holiness no man shall see the Lord;" and their conduct, in general, will bear a comparison with any class of their co-religionists.

Particular B., so called because holding that Christ died for an elect number, and *General* B., who maintain that he died for all men, constitute the two leading sects into which the body is divided. *English* B., in their church order and government, are the same as Congregationalists, the rite of baptism excepted. *Scotch* B., properly so called, insist on a plurality of pastors in every church, and the exercise of mutual exhortation by the members in their public assemblies. There are Baptist churches in England, however, who are *Scotch* in their order, and English B. in Scotland who are *English* in theirs. Seventh-day B., we believe, are to be found almost wholly in America, who observe not the first day of the week, but the seventh, as a day of rest. There are, besides these great divisions, various small associations of B. scattered over Great Britain, America, and the continent of Europe, whose opinions cannot be gathered up into systematic arrangement, and who would not approve of being identified with any of the sectarian designations here set down.

The particular tenet which characterizes B. among their fellow-Christians is, that baptism is an ordinance the validity of which depends on an intelligent faith on the

* The Baptists of Great Britain and America reject the name of Anabaptists, as expressing only an accidental circumstance of their tenets—viz., the rebaptizing of converts from other sects, who happen to have been baptized in infancy, and also as associating them with the scandals of the German Anabaptists (q.v.) of the 16th c., from whom they claim to be historically distinct. From the same feeling, the modern sect in Germany and Holland style themselves *Taufgesinnte*.

part of the recipient. Their views on the matter of baptism may be reduced to two heads—the *subjects* and *mode* of baptism. The subjects of the baptismal rite they hold to be believers in the Lord Jesus Christ. They ground their faith in this matter on the following positions—namely: 1st, The Lord in his commission to his apostles associates teaching with baptism, and *limits* the administration of the rite to *the taught*. 2d, The Acts of the Apostles shows how they understood their Master, for they baptized none but believers, or such as appeared to be so. 3d, That the kingdom of Christ as it appears in this world is restricted to credibly converted persons, as is shown in his discourse with Nicodemus: "Except a man be born again, he cannot see the kingdom of God;" and his subsequent statements on to the hour when he emitted his memorable confession before Pilate, "My kingdom is not of this world," uniformly proves that its subjects and institutes form a distinct and separate community from the Jewish theocracy, which embraced parents and children in nonage in one commonwealth. 4th, They maintain that the ordinance, as explained in the New Testament, always points to a moral and spiritual change, apart from which it were indeed a meaningless ceremony.

As respects the *mode*, the B. hold that only immersion in water *is* baptism. They argue, that the original term *baptizo* conveys this meaning, and no other; that nothing less can possibly answer to the apostle's explanation in Rom. vi. 4, 5, and Col. ii. 12, "buried with him in baptism, wherein also ye are risen with him;" that the many allusions in the epistles to the churches manifestly bear out this interpretation; and, finally, that the fact of John baptizing at a spot selected for the purpose "*because* there was *much water* there," is perfectly conclusive.

Their form of church government is congregational. They maintain that the only order of officers remaining in the church since inspiration ceased are pastors (otherwise called elders and bishops), deacons, and evangelists; that the number of official persons in each of the apostolic churches cannot be ascertained from the record, but must of necessity have depended—and always must depend—on circumstances; that each church is possessed of the power of self-government under its exalted head, Jesus Christ, subject to no foreign tribunal or court of review; that discipline is to be exercised by the rulers in presence and with the consent of all the members, and parties received or excluded at their voice.

The B. are divided among themselves regarding communion—one portion receiving conscientious Pedobaptists to the Lord's table and membership; the other refusing this privilege to any but Baptists. The churches of the former are called open communionists; the latter, strict communionists.

Next to the Moravians, the B. were earliest in the field of missions. They have been honored to plant Christian churches in many parts of continental India, Ceylon, in the Bahamas, the West Indies, Africa, and China. No mission band has arisen in any denomination, within the century, who have surpassed the agents of the B. missionary society in ardent zeal, patient perseverance, and invincible fortitude, in carrying out their Lord's commission to preach the gospel to every creature. The names of Carey, Marshman, Ward, and Knibb will be had in grateful remembrance by all succeeding generations; and their footsteps are now being trod by a long list of Christian missionaries of all evangelical persuasions, who are "the messengers of the churches and the glory of Christ."

This section of the Christian church was probably less zealous than their brethren, at one time, in preparing their ministers for their work by a sound course of study in theology and general literature; but this reproach has been long rolled away. They have schools of learning inferior to none for training young men of piety for pastoral duties, presided over by men of great ability. At Bristol, Rawdon (near Leeds), Regent's park, (London), Pontypool, Haverfordwest, and Nottingham, there exist seminaries of learning which are entitled to give certificates qualifying for matriculation at the university of London; and many of the students have already taken degrees and honors there. There are also the Pastor's college, in connection with the Tabernacle, London, and theological institutions at Edinburgh, Manchester, and Llangollen.

In the *Baptist Handbook* for 1876, the returns of B. churches and members are as follows: British, 2620 churches, 263,729 members; colonial, 1084 churches, 98,149 members; foreign, 22,124 churches, 1,815,868 members; total, 25,828 churches, 2,174,746 members. The United States possessed, in 1874, 21,510 churches and 1,761,171 members. England, in 1875, had 4572 churches and chapels, with 191,763 members; Wales, 1136, with 62,221 members; Scotland, 192, with 8155 members; Ireland, 74, with 1610 members.

BAPTISTS (*ante*). The history of this denomination in the United States can be traced far back towards the first colonizing of New England by the pilgrim fathers. The first B. churches, however, were founded by Roger Williams, in Providence, R. I., and by John Clark, in Newport, R. I., during the year 1639. Williams at first met considerable opposition and persecution for declining to recognize the power of the civil magistrate in matters of religion; but in 1644 he obtained a charter for the land which he and his followers had colonized. It is now called Rhode Island, and was among the first states to grant religious liberty. In the other colonies the persecution of the Baptists lasted many years, occasioned not altogether by their religious views, but in part

by their extreme views regarding civil government. Laws were made against them in Massachusetts in 1644, and some of them were banished in 1669; they were proscribed in New York in 1662, and in Virginia in 1664, but about the beginning of the 18th c. the authorities became more tolerant. It may be said here that the article on religious liberty to be found in the amendments of our constitution is in no small part due to the strenuous efforts of the B. in 1789.

The B. in the United States are divided into several denominations. After the revolution their cause steadily advanced; and the regular or associated B. denomination has now in the United States alone, according to the *Baptist Year Book* for 1879, 1075 associations, 24,499 churches, 14,954 ministers, 11,845 Sunday-schools, with 827,770 volumes in the libraries, and 2,102,034 church members. They have 9 theological seminaries: 2 in New York, at Hamilton and Rochester; 2 in Illinois, at Upper Alton and Morgan Park; 2 in Kentucky, at Georgetown and Louisville; 1 at Newton Center, Mass.; 1 at Upland, Pa., and 1 at Liberty, Mo.; the total number of students being 338, and 37 instructors; the total value of property $1,685,178, and the endowment amounting to $1,245,545. They have 31 colleges and universities, of which Brown university, founded in 1764 at Providence, R. I., is the most celebrated. The more prominent of the others are Colby university, at Waterville, Me.; Madison university, at Hamilton, N. Y.; Columbian university, at Washington, D.C.; the university of Rochester, N. Y.; the university of Chicago, Ill.; and Vassar college for women, at Poughkeepsie, N. Y. Total number of students in all the colleges, 4897, with 269 instructors; total value of property, $7,096,726; amount of endowment, $2,962,275; and 208,835 volumes in the various libraries of the colleges. According to the *Year Book*, they have 47 academies, seminaries, institutes, and female colleges, with 4632 students; a property value of $2,361,000, and endowment of $392,545. The home and foreign statistics for the year 1878 were, for the five continents, as far as reported:

	Associations.	Churches.	Ministers.	Members.
North America	1,096	25,325	15,525	2,192,454
Europe	60	3,053	2,089	308,913
Asia	1	576	234	34,784
Africa	..	54	35	2,794
Australia	4	135	85	7,002
Total	1,161	29,143	17,968	2,545,947
In 1877	1,132	28,513	17,931	2,472,790

As to doctrine, government, and worship, the Calvinistic B. in America, as in England, agree in all essential points, except as to the subjects and mode of baptism, with the evangelical Congregationalists. They require baptism by immersion to entitle them to church membership, denying that any other mode is scriptural or valid. They disallow the baptism of infants, administering that rite to none but believers on the confession of their personal faith. In respect to communing at the Lord's supper with persons not regularly immersed, there is difference of view and of practice among B.—some holding to "open" and some to "close" communion. Open communionists, common among English B., are in this country a very small minority of the denomination.

The B. have been distinguished for zeal and success in evangelizing the newer portions of the country, and must be recognized as supplying much of the Christian force with which American society has been molded. As a denomination, they are positive and aggressive. They are represented in nearly all the great cities by powerful, well-equipped, and rapidly augmenting churches. In missions among the heathen, they have shown great zeal; and though they have not sought to cover a great number of fields, they are not surpassed in modern times in diligent and persevering efforts. In some countries, notably in Burmah formerly, and in northern India recently, their success in missionary labor has risen to grand proportions.

The associated B. in the United States meet annually in stated conventions for the promotion of missions, education, beneficence, etc. They have a publication society at Philadelphia.

BAPTISTS, ANTI-MISSION. See Baptists, Old School.

BAPTISTS, CAMPBELLITE. See Disciples of Christ.

BAPTISTS, FREE-WILL, had their origin in a discussion which arose (1779) among B. in New Hampshire on the doctrines of Calvin, during which Benjamin Randall, one of Whitefield's converts, was called to account for preaching a general atonement and the ability of sinners to accept Christ. Having united with a church which agreed with his views, he was ordained at New Durham (1780), and, in connection with others of like faith, labored with zeal and success in preaching and establishing churches. They wished to be known simply as Baptists, but their opponents called them "free-willers," and both names having been combined, the denomination has adopted "Free-will Baptists" as their distinctive appellation. Their government, like that of the regular Baptists, is congregational, and they hold that scriptural baptism is the immersion of believers. Their peculiar doctrinal views are the general extent of the atonement, the free offer of salvation to all men, the freedom of the will (involving ability to accept or

refuse Christ), and the right of true believers to participate in the Lord's supper. By this last tenet they rank as "open communionists." In 1784, the first quarterly meeting was organized among them; in 1792, the first yearly meeting, composed of delegates from the quarterly meetings; in 1827, a general conference was formed, which now meets triennially. In 1841, the Free-communion Baptists, a denomination which had arisen in the 18th c. in Rhode Island and Connecticut, and owed its origin to Whitefield's preaching, united with them. The whole body have uniformly held anti-slavery views, and, a few years before the war of the rebellion, withdrew fellowship from 4000 members in North Carolina because they were slave-holders; and, for the same reason, declined to receive 12,000 members in Kentucky who sent delegates to their general conference. At the fifth conference (1831), the subject of foot-washing having been discussed, liberty was given to the churches to retain or give up the ordinance, as each might prefer. Many of them have since chosen to give it up. They have flourishing literary institutions in several states; among which are Bates college at Lewiston, Me.; Hillsdale college, Mich.; a theological seminary at New Hampton, N. H.; and a printing establishment at the same place. They have about 1500 churches, 1300 ministers, and 75,000 members, most of whom are in the northern states and Canada.

BAPTISTS, GERMAN, commonly called DUNKERS or TUNKERS (from the German *tunken*, to "dip"), and, among themselves, BRETHREN, originated at Schwarzenau, Germany, 1708, but were driven by persecution to America about 1725. In 1790, a party who held universalist views having separated from them, the whole denomination were, somewhat perversely, supposed to agree with them. But they have always denied the charge and, with the Mennonites, appeal to the confessions of faith published in Holland two centuries ago. They practice trine immersion (placing the candidate forward instead of backward) with the laying on of hands while the person is in the water. Their officers are bishops, elders, teachers, and deacons. The bishops are chosen from among experienced and faithful teachers. It is their duty to itinerate among the congregation, preach, officiate at marriages and funerals, and be present at love feasts, communions, ordinations, elections of teachers and deacons, and when an officer is to be excommunicated. An elder is the oldest teacher in a congregation where there is no bishop. His duties are to appoint meetings, exhort, preach, baptize, travel occasionally, and to perform all the work of a bishop when none is present. Teachers are elected. Their duties are to exhort and preach at stated meetings, and, when requested by a bishop or an elder, to officiate at baptisms and marriages. The deacons take care of the poor widows and their children, visit the families of the congregation to exhort, comfort, and instruct them, reconcile offenses and misunderstandings; and, upon occasion, to exhort, read the scriptures, and pray at meetings. An annual meeting of bishops, teachers and delegates is held about May, at which a committee of five bishops decide cases presented to them by the teachers and delegates. In plainness of speech and dress German Baptists resemble the society of Friends. They do not go to law, will not fight, and seldom take interest on money loaned to their poorer brethren. They are opposed to statistics, as savoring of pride; but, according to recent reports, they have 500 churches, 1,200 preachers, and 50,000 church members, chiefly in Pennsylvania, Maryland, Virginia, Ohio, and Indiana.

BAPTISTS, OLD SCHOOL, a sect frequently called ANTI-MISSION or ANTI-EFFORT B., from their opposition to missionary societies, Sunday schools, and all religious organizations that make man's salvation dependent on human effort. They have neither colleges nor theological seminaries. They are mostly to be found in the western and south-western states. They have 900 churches, 400 ministers, and 40,000 members. At present they are not increasing.

BAPTISTS, SEVENTH-DAY, as their name implies, are distinguished from other Baptists and other denominations by regarding the seventh day of the week as the Sabbath. They believe that the first day was not generally observed as such in the Christian church before the time of Constantine. Traces of seventh-day keepers are found in the days of Gregory I. (590), Gregory VII. (1075), and in the 12th century. In Germany they appeared late in the 15th century. In England they were organized as a denomination in 1650, under the name of Sabbatarians, and, at the close of the c., had 11 churches, of which only three remain. In America they date from the last quarter of the 17th c., having formed their first church at Newport, R. I., about 1671. They commenced their yearly meetings at the opening of the 18th c., and their general conference at the beginning of the 19th c., holding it at first annually, but now triennially. In 1818 they adopted the name Seventh-day Baptists instead of Sabbatarians; and in 1845 arranged themselves in five associations, eastern, western, central, Virginia, and Ohio. They favor total abstinence from strong drink, and other reforms; have a department for publishing tracts and books, and support missionaries in China and Palestine. At the general conference in 1878, 55 churches were represented by letter. They have 75 churches, 82 ministers, and 7,336 members. Their literary institutions are a university at Alfred Center, N. Y., colleges at Shiloh, N. J., and Milton, Wis., De Ruyter institute, N. Y., and several academies.

BAPTISTS, SEVENTH-DAY GERMAN, a denomination in the United States which seceded from the German Baptists, or Dunkers. They recommend celibacy as

a virtue, but do not require it, and worship on the seventh day instead of the first day of the week. Their largest settlement is at Snowhill, Franklin co., Pa. They have probably a few hundred members, and a dozen ministers.

BAPTISTS, SIX-PRINCIPLE, a small denomination, first heard of as a separate organization in Rhode Island in 1639. They are of the Arminian persuasion, holding to a general atonement; and their creed consists of the six principles to be found in Heb. vi. 1, 2, namely: repentance, faith, baptism, laying on of hands, the resurrection, and the eternal judgment. Their ministers are poorly educated and poorly supported, and the denomination is confined to Rhode Island, New York, Pennsylvania, and Massachusetts. They have 20 churches, 12 ministers, and 3,000 members.

BAPTISTS—THE CHURCH OF GOD. See WINEBRENNERIANS.

BAR is any elongated piece of wood, metal, or other solid substance. In the iron manufacture, B. is a rod, either round or square shafted. The round ones are made by drawing the iron red-hot through a bore or hole in a plate, and the square ones by passing it likewise red-hot through a roller-mill between two rollers counter-grooved, with their triangular-grooved faces forming the square opening for the passage of the iron. Railway and knee iron are made in the same manner. See IRON.

BAR, in hydrography, is a bank opposite the mouth of a river, which obstructs or *bars* the entrance of vessels. The B. is formed where the rush of the stream is arrested by the water of the sea, as the mud and sand suspended in the river water are thus allowed to be deposited. It is thus that deltas are formed at the mouths of rivers. The navigation of many streams (as the Danube) is kept open only by constant dredging or other artificial means.

BAR, in music, is a line drawn across the stave, to divide the music into small portions of equal duration; each of these small portions is itself called a *bar*.

BAR, or BARR, in heraldry, one of those more important figures or charges in heraldry which are known as *ordinaries*. By the heralds of this country, the ordinaries, or as, by way of eminence, they are called, the "honorable ordinaries," are commonly reckoned as ten in number, the subordinaries, or minor charges, being greatly more numerous. The B., like the fess (q.v.), is formed by two horizontal lines passing over the shield, but it differs from it in size, the fess occupying a third, the B. only a fifth part of the shield. There is this further difference between these two ordinaries, that the fess is confined to the center, while the B. may be borne in several parts of the shield. There is a diminutive of the B. called the closet, which is half a B.; and again of the closet, called the barrulet, which is half a closet, or the fourth part of a bar.—BAR-GEMEL is a double bar, from the French *jumeau*, f. *jumelle*, a twin.

BAR, in law. This word has several legal meanings; thus, it is the term used to signify an inclosure or fixed place in a court of justice where lawyers may plead, or perhaps more correctly, where they can address their advocacy on behalf of their clients. A veiled-off space within the houses of parliament is similarly called the B. See PLEADING. The dock, or inclosed space where persons accused of felonies and other offenses stand or sit during their trial, is also called the B.; hence the expression, "prisoner at the B." This word is likewise applied to the gate or rail thrown across a turnpike road for the levying of the toll-duties. It has also a general meaning in legal procedure, signifying something by way of stoppage or prevention. There is also a trial at B., that is, a trial before the judges of a particular court, who sit together for that purpose *in banc* (q.v.). See BAR OF DOWER, PLEA, TRIAL AT BAR, TOLL, FELONY, TREASON, BARRISTERS, ADVOCATE.

BAR, PLEAS IN. See PLEADING and PLEA.

BAR, TOLL. See TOLL.

BAR, TRIAL AT. See TRIAL AT BAR.

BARABA', a steppe of Siberia, extending between the rivers Obe and Irtish, and occupying more than 100,000 sq.m., and covered with salt lakes and marshes. It was colonized by the Russians in 1767, who have since cultivated parts of it.

BAR'ABOO, chief t. of Sauk co., Wis., on B. river; pop. of township, '70, 2758. It has a number of manufactories.

BARAB'RA, or BERAB'ERA, people of a district in upper Nubia, different from the Berbers. They trade in cattle with Egypt.

BARACO'A, a seaport t. on the n.e. coast of Cuba belonging to the Spaniards. Lat. 20° 22′ n., long. 74° 30′ w. In its vicinity is a remarkable mountain called the anvil of Baracoa.

BARA'DA, supposed to be the Abana of the Bible; a river of Syria, rising in Anti-Libanus, and ending in marshy lakes e. of Damascus, which city is on the main stream, the stream being made to divide in the city, but uniting again after passing it.

BARA'GA, a co. in n. Michigan, taken from Houghton co. in 1875. Pop. '80, 1804.

BARA'GA, FRIEDRICH, D.D., 1797–1868; a Roman Catholic bishop and missionary, native of Carniola. He came to this country in 1830, and spent his whole life in the

Chippewa and Ottawa missions in Michigan. He wrote a Chippewa grammar and dictionary, and in German, the *History, Character, and Habits of the North American Indians.*

BARAGUAY D'HILLIERS, ACHILLE, a French general, the son of the succeeding, was b. in Paris on the 6th of Sept., 1795. He rose rapidly through the inferior military grades, and obtained, in 1832, the appointment of governor in the military school of St. Cyr, where he suppressed a republican conspiracy that threatened to break out in the institution. After he had served with various success in more than one campaign in Algeria, he was promoted to the rank of lieut. gen., on the 6th of Aug., 1843; and in 1847, he was made inspector gen. of infantry. After the revolution of Feb., 1848, he was chosen a member of the national assembly, in which he joined the party of reaction, and was in favor of the restriction of the press. In the beginning of Nov., 1849, he went to Rome, as commander-in-chief of the French army sent to sustain the authority of the pope. He returned in 1850; and in Jan., 1851, obtained the command of the army of Paris, in the place of Changarnier. B. concurred in the policy of the *coup d'état* of Dec., 1851, and was made a member of the consultative commission. During the Crimean war, he received the command of the French expeditionary corps of the Baltic, and co-operated with the British fleet in the capture of Bomarsund. He was afterwards made a marshal of France, and commanded in the Italian war of 1859. In 1871, he was made president of the court appointed to investigate the conduct of the generals who surrendered fortresses during the late war. He d. 6th June, 1878.

BARAGUAY D'HILLIERS, LOUIS, a distinguished general of the French empire, was b. in Paris in 1764. After serving under Custine and Menou, he received an appointment in the army of Italy from Napoleon, and was a sharer in all the success of the campaigns of 1796–7. He was made a general of division; and in virtue of Napoleon's treaty with the Venetian republic in May 16, 1797, commandant of Venice. B. accompanied the expedition to Egypt; and afterwards successively held appointments in the armies of the Rhine and the Tyrol, and in Catalonia. He headed a division in the Russian campaign of 1812; but on the retreat, he incurred the displeasure of Napoleon. He was sent as governor to Berlin, where he soon after died of grief and exhaustion.

BARAHAT, a t. in n. Hindustan, in the Himalayas, 30° 43′ n., 78° 29′ east. The t. was nearly ruined in 1803 by an earthquake, most of the houses (built of stone with slate roofs) being thrown down. In the neighborhood is a trident in honor of Siva; a copper pedestal upholding a brass shaft 12 ft. high, with forks 6 ft. long. Though this curious trident bears a legible inscription, no one has yet translated it, and the origin of the work is unknown. The temple in which it stood was destroyed by an earthquake.

BARANOFF, ALEXANDER ANDREYEVITCH, 1746–1819; first governor of Russian America. In 1796, he established a colony on Behring's strait; in 1799 took possession of one of the Sitka islands (now Baranoff island), began trade with the natives, and subsequently extended his operations to Canton, Sandwich islands, Boston, New York, and other distant places. He died while on his return to Russia.

BARANTE, AMABLE GUILLAUME PROSPER, Baron de Brugiére, 1782–1866; a French statesman and historian of the dukes of Burgundy. While yet young, he was employed in political missions in Germany, Poland, and Spain, and was prefect at Nantes at the time of Napoleon's return from Elba, when he at once resigned. On the second restoration he was made councilor of state and secretary-general to the minister of the interior, and was elected to the chamber of the deputies. In 1819, he was made a peer of France, and took an active part in the debates of the chamber. After the revolution of 1830, he was sent as ambassador to Turin, and five years later filled the same position at St. Petersburg. He supported Louis Philippe, and retired from public life on the fall of the monarchy in 1848. His great work is the *History of the Dukes of Burgundy of the House of Valois*, which procured for him membership in the academy. He was the author of historical and literary miscellanies, a work on constitutional questions, a history of the national convention, a history of the directory, studies in history and biography, etc.

BARAN'YA, a co. in s.e. Hungary on the Danube and the Drave, on the border of Slavonia; 1966 sq.m.: pop. '70, 283,506, more than half Magyars. It is fertile, producing cereals, tobacco, and wine, and is rich in cattle. Chief towns, Pécs, the capital, and Mohacs, where, in 1526, Hungary's king, army, and independence were lost.

BA'RAS KHOTUN', or BARS KHOTAN', a ruined city on the banks of the Kherlon, one of the head-streams of the Amur, in the Mongol country. Some suppose it to have been built by the emperor Kublai; others, that it was erected by Toghon Timur in the 14th c., after the expulsion of the Mongols from China. The remains of the mud walls show that the city had been 5 m. in circumference.

BARATIERE, or BARETTIER, JOHN PHILIP, 1721–40; a wonder of precocity, a native of Nuremberg, the son of a Protestant pastor, exiled from France on the revocation of the edict of Nantes. Before his 5th year he read and wrote French, German, and Latin, and afterwards, with almost no assistance, mastered Greek, Hebrew, Syriac, Arabic, and Ethiopic. Before he was 9 years old he made a catalogue of the more difficult words in Chaldee and Hebrew, and in his 13th year made a translation of some of the

Hebrew writings of Benjamin of Tudela, with notes and historical disquisitions. About the same time he published theological disquisitions, and amused himself with abstruse astronomical and other mathematical calculations. When but 14 he was made master of arts by the university of Halle, on which occasion he defended 14 propositions before an immense audience. The royal society of Berlin made him a member, and the king gave his father a living. Some time before his death he began a history of the church. He was never strong in health, and the active mental labor, which he would not relinquish, took him away 4 months before he was 20 years old.

BARATYNS'KI, JEWGENIJ ABRAMOVITCH, 1792–1844; a Russian poet. He served as a soldier in Finland, where he imbibed the ideas that appear in his poem of *Eva*. His other notable work is *Gypsy*, a picture of Russian high life.

BARB, the designation of a noble breed of horses cultivated by the Moors of Barbary, and introduced by them into Spain. Barbs are less remarkable for their beauty and symmetry, than for their speed, endurance, abstinence, and gentle temper.

BAR'BACAN. See BARBICAN.

BARBACE'NA, a city of Brazil, in the province of Minas Geraes, 150 m. n.w. from Rio de Janeiro. It is situated on the top of two hills in the Sierra Mantiqueira, and at an elevation of about 3500 ft. above the sea, so that, although within the tropics, it enjoys a mild climate. The streets are broad and straight, the principal ones paved and provided with footpaths. The houses are low, and have gardens behind. The inhabitants are chiefly engaged in gold-mining and in exporting coffee and cotton to Rio de Janeiro. B. is the center of a productive district, the pop. of which is 12,000.

BARBA'DOES, the most easterly of the Caribbees, and the residence of the governor-general of the British Windward islands. See ANTILLES. The lat. and long. of its capital, Bridgetown, are 13° 4′ n. and 59° 37′ west. Its area is about 166 sq.m., or 106,240 acres—the unprecedented proportion of 100,000 being under cultivation. Besides the capital, B. contains 3 other towns, all more or less in a state of decay—Jamestown, Speights-town, and Oistin. B. affords no harbors, being almost encircled by coral-reefs, which here and there extend as much as 3 m. to seaward. Inside of the coral-reefs, the coast, excepting at two points, presents long lines of sandy beach—one of the most remarkable being Carlisle bay with its exposed roadstead, on which Bridgetown stands. Setting aside occasional attacks of yellow fever, the climate is healthy. In 1844, the fall of rain was 72 inches; and the temperature is said to have ranged only between 76½° and 83½° F. Shocks of earthquake are sometimes felt, and thunder-storms are frequent and severe. But hurricanes are the grand scourge of Barbadoes. In 1780, one of them destroyed 4326 persons and property to the value of £1,320,564 sterling; and in 1831, another destroyed 1591 persons and property to the value of £1,602,800 sterling. Of the former of these, the violence appears to have surpassed all belief—the winds and the waves between them having carried a 12 pounder gun a distance of 140 yards.

In 1834, the commencement of the apprenticeship under the imperial act of emancipation, the pop. was 102,231; by 1871, it had increased to 162,042, being an average of 976 inhabitants to every sq.mile. The trade and the revenue bear a similar testimony to the benefits of emancipation. Between 1833–75 the revenue had increased from £20,975 to £132,123; the imports, from £481,610 to £1,187,493; the exports, from £408,363 to £1,174,910 (value of sugar exported, £976,886); the total tonnage entered and cleared in 1875 was 409,176 tons. Being universally cultivated in regular plantations, the island affords no room for the squatting of negroes on unreclaimed lands, as in Jamaca and other West-India possessions. On this account, if from no other cause, the negro population have been compelled to labor diligently for hire, and are generally in a condition most creditable to their industry and prudence, contrasting favorably with some of the lower classes among the whites. Altogether, however, the Barbadians are a shrewd and clever people. B. is the see of a bishop. It contains also many well-endowed seminaries—Codrington college, in particular, having a revenue of £3000 a year. It was first colonized by the English in 1625, having previously been depopulated by the Spaniards. The peace of B. was seriously disturbed in 1876, by riots occasioned by the proposed confederation of the Windward islands, in which several lives were lost, and great damage done to property.

BARBA'DOES CHERRY, the name given in the West Indies to the fruit of two small trees, *Malpighia urens* and *M. glabra*, which are cultivated for its sake. Clusters of fruit are produced from the axils of the leaves. The fruit of *M. urens* is small, that of *M. glabra* is like a mayduke cherry in size and appearance, but inferior in flavor. Each fruit contains three triangular seeds. The leaves of *M. urens* have stinging hairs on the under-side. See MALPIGHIACEÆ.

BARBA'DOES GOOSEBERRY, *Pereskia aculeata*, a pleasant West Indian fruit, produced by a plant of the natural order *cacteæ* (q.v.), with a round stem, thick flat alternate leaves, and large strong spines. The fruit has expectorant properties.

BARBADOES LEG, which seems to be identical with the *elephantiasis of the Arabs*, is a disease which is characterized by hypertrophy of the skin and of the subcutaneous areolar tissue. Notwithstanding its name, it may affect the arm, female breast, etc. It begins with acute febrile symptoms, and inflammation of the superficial lymphatic

vessels. The part swells, and becomes uneasy from tension, the glands being especially large and hard. The skin varies in appearance, being sometimes white and shining, and in other cases of a dark color, and studded with projecting veins. The swelling is sometimes very great, and quite hard. In some parts of the body, skin which would naturally weigh less than a couple of ounces, is thus converted into a tumor weighing from 100 to 150 lbs. The disease is endemic in the tropics; and in the cases which we see in Great Britain, it always appears that the disease commenced in a hot country.

Iodine is recommended by some doctors, and well-regulated pressure by others. The leg has been amputated, in consequence of the annoyance caused by its great weight; but this should be regarded as an ultimate resource, and ligation of the femoral artery, which often causes great subsidence of the swelling, should be first tried.

BAR'BARA, SAINT, who suffered martyrdom at Nicomedia, in Bithynia, about 236, or, according to other accounts, at Heliopolis, in Egypt, about 306, was of good birth, and well educated by her father, Dioscorus. To avoid disturbance in her studies, he had a tower built for her, where she spent her youth in the deepest solitude. While in this retirement, she was led, through Origen, as is said, to embrace Christianity. Her father, a fanatic heathen, learning his daughter's conversion, and failing to induce her to renounce Christ, delivered her up to the governor, Martianus, to be dealt with by the law. Martianus, struck with the intelligence and beauty of the maiden, attempted first by arguments to make her relinquish Christianity, and when that failed, had recourse to the most exquisite tortures. At last, the blinded father offered himself to strike off his daughter's head. Scarcely was the deed done, when he was struck with lightning. Hence St. B. is to this day prayed to in storms. For the same reason, she is the patron saint of artillery, and her image was at one time frequently placed on arsenals, powder-magazines, etc. The powder-room in a French ship of war is to this day called Sainte-Barbe. St. B.'s day is the 4th December.

BARBA'REA. See CRESS.

BARBARELLI, GIORGIO. See GIORGIONE, *ante.*

BARBARIAN (Gr. *barbaros*), among the Greeks, as early as the time of Homer, signified one who could not speak the Greek language; and this restricted signification was not wholly obsolete even in the age of Plato, for the latter divides the entire human race into *Hellenes* and *Barbaroi.* The origin of the word is unknown, if it be not artificially formed, on the principle of imitation, to represent a meaningless babble of sound, such as the Greeks conceived all foreign languages to be. It first began to acquire its secondary and invidious signification at the period of the Persian wars. The Greeks, who always exhibited a proud consciousness of their superior intellect and privileges, employed the term to designate the character of their enemies. It then meant whatever was opposed to Greek civilization, freedom, or intelligence; but it could not yet have attained the degraded sense in which it is now used, for the Romans in the time of Plautus accepted the appellation, and called themselves *Barbaroi.* Subsequently, when Rome, under Augustus, became the mistress of the world, the word was applied to all the Germanic and Scythian tribes with whom she came into contact. In modern times, B. signifies savage, uncivilized, or ignorant.

BARBAROS'SA. See FREDERICK I.

BARBAROS'SA, AROODJE or HARUDJ and KHAIR EDDIN, two brothers, renegade Greeks, natives of Mitylene, who, as Turkish corsairs, were the terror of the Mediterranean during the first half of the 16th century. They made themselves masters of Algeria (q.v.) and Tunis, and brought these countries under the sovereignty of the Turkish sultan.

BARBAROUX, CHARLES, one of the most distinguished and energetic of the Girondists, was b. at Marseilles in 1767. The new ideas of equality and fraternity found in B. a warm advocate, and he did much to promote their spread. He was elected the special delegate of Marseilles, to attend the constituent assembly at Paris. There he opposed the court, and took part with the minister, Roland, then out of favor. After the events of the 10th of Aug., he returned to his native town, where he was received with enthusiasm, and was soon after chosen delegate to the convention. In the convention, he adhered to the Girondists, and belonged to the party who, at the trial of the king, voted for an appeal to the people. As B. boldly opposed the party of Marat and Robespierre, and even directly accused the latter of aiming at the dictatorship, he was, in May, 1793, proscribed as a royalist and an enemy of the republic. He wandered about the country, hiding himself as he best could, for thirteen months, when he was taken and perished at Bordeaux by the guillotine, June 25, 1794. B. understood the revolutionary crisis much better than the most of his party. Had the Girondists generally possessed anything like his energy and sagacity, the Jacobins must have succumbed, and much bloodshed and horror would have been spared to France and the world.

BARBARY, an extensive region in northern Africa, comprising the countries known in modern times under the names of Barca, Tripoli proper, Fezzan, Tunis, Algeria, and Morocco, together with the half-independent province of Sus; and in ancient times, under those of *Mauritania, Numidia, Africa Propria,* and *Cyrenaica.* It stretches from Egypt to the Atlantic ocean, and from the Mediterranean to the desert of Sahara, or between

long. 10° w. and 25° e., and lat. 25° to 37° n. The n.w. of this region is divided by the Atlas mountains into two parts: the northern comprising Morocco, Algeria, and Tunis; the southern, a half-desert region, called Belud-el-Jerid, the country of dates. Though pertaining geographically to Africa, B. is not specially African in any of its characteristics; but in climate, flora, fauna, and geological configuration, belongs to that great region which forms the basin of the Mediterranean. It is watered by many small streams, which either flow into the Mediterranean or into the salt-lakes on the edge of the desert, according as they rise on the northern or southern slopes of the Atlas mountains. A large portion of the country is capable of cultivation, and sandy or rocky tracts are rare, except on the southern margin. During the times of the Carthaginians, Greeks, and Romans, it was richly fertile, and all the natural conditions of its ancient productiveness still remain.—For an account of the climate, geology, productions, etc., see the various countries.

Among the people, besides the French and other Europeans, seven distinct races may be enumerated: Berbers (or Kabyles), Moors, Bedouins, Jews, Turks, Kuluglis, and Negroes. The Berbers and Beduins inhabit the open country, while the Moors, on the other hand, reside in the towns. Most of the Berber tribes are either wholly free, or subject to the mere nominal jurisdiction of native chiefs, kaids, judges, etc. The Beduins luxuriate in equal liberty. Jews had settled here in ancient times, but the greater number of that race immigrated when the Moors were expelled from Spain. The Turks entered B. in the 16th century. They form the dominant race in Tripoli and Tunis, but never established themselves permanently in Morocco. Their sway in Algeria was brought to an end by the French. The Kuluglis (the children of Turks by native mothers) are excluded from the possession of all the paternal rights and privileges. The negroes are not natives of B., but are brought thither as slaves, principally from Sudan and Guinea. They are for the most part domestic slaves. The population, exclusive of Jews and Christians, is about 11,000,000, all Mohammedans. Arabic is the language of commerce and intercourse, and in Morocco, the language of government, and the mother-tongue of Beduins, Moors, and even Jews; but in Tunis and Tripoli, where, as we have said, the Turks are still dominant, the language of government is Turkish. The Berbers proper, or Kabyles, especially in the highlands, to which they have been driven by foreign conquerors, use a peculiar speech among themselves.

In the oldest historical times, we find the Mauri (the ancestors of the modern Moors) mentioned as residing in the n.w. of B., the Numidians in the interior and eastern parts, and the Phenician colonies on the coasts. These last people formed settlements and founded cities—among them Utica, Hippo, Hadrumetum, Leptis, and afterwards Carthage, about 1000 B.C. It does not appear that they ever penetrated far into the interior. Confining themselves to the coast between the Great Syrtis and the straits of Gibraltar, they maintained commerce with the people of the interior and the seaports of the Mediterranean. In the 7th c. B.C., the Greeks founded Cyrene, considerably to the e. of Carthage, and colonized the plateau of Barca, now styled Jebel-el-Achdar by the Arabs. While the Phenician colonies held sway on the coast, the Mauri and the Numidians were divided into several independent tribes, and like their neighbors the Gætuli, were wholly uncivilized. After the second Punic war, the Romans extended their sway over Carthaginian Africa, which became a Roman province at the close of the third Punic war, when the city of Carthage was sacked and destroyed. Numidia was "annexed" after the victory over Jugurtha, and Mauritania after the defeat of king Juba, the ally of Pompey's party. The son of Juba, bearing the same name, was allowed to reign as a nominal sovereign by Augustus, but Mauritania was, in fact a Roman province. Thus, the Romans had acquired a territory in Africa extending from the Great Syrtis to the Atlantic (corresponding to the modern states of B.), which formed some of the largest and most flourishing provinces of their vast empire. Everywhere they built large towns, whose extensive ruins are still to be seen scattered over the whole land, even to the verge of the desert; as, for instance, those at El-Haman, in the regency of Tunis, at Sava, Musulupium, and especially the splendid city of ruins, Lambasa, not far from the desert of Sahara. The Romans had, in general, only two legions, numbering 24.000 men, in their African provinces; nevertheless, their authority was uncontested, and they were enabled to undertake important works, such as the cisterns and aqueducts at Rusicada, Hippo, and Cirta, and the temples and amphitheatres of Calama and Anuna, which clearly show that the inhabitants enjoyed the benefits of a safe and powerful civilization.

Under Constantine, North Africa was divided into the several provinces, Mauritania, Tingitana, Mauritania-Cæsariensis (on the e. of the former), Mauritania-Sitifensis, Numidia, Zeugitania, Byzacium, Cyrenaica, and the Regio Syrtica. At the division of the empire, the whole of these provinces, with the exception of the last, fell to the share of the Western empire. About this time, Christianity was promulgated in Africa, and with such success, that in the three Mauritanias there were more than 160 dioceses. As Roman power declined in Europe, the consequences were severely felt in the African provinces. Religious disturbances, native revolts, and the ambitious aspirations of the Roman governors after independence, loosened the political bands which bound the provinces together, and made them an easy prey to the Vandals, who landed in Africa, in 429 A.D., under the ferocious Genseric, and in an incredibly short space of time over-

ran the country, which they savagely misgoverned until 533, when they were defeated by Justinian's great general, Belisarius. Meanwhile the Numidians and the Mauri had made themselves masters of the interior and of the coast of Mauritania-Tingitana, and the Greek-Roman territories were restricted to the neighborhood of Carthage and some points on the coast. The whole country of B. was thus made an easy prey for the Arabs, and in 647, Abdallah-ben-Said, with 40,000 fanatical Mohammedans from Egypt, defeated and slew the Greek prefect, Gregorius, at Tripoli. He did not, however, follow up his victories; but in 665–670 A.D., the Arabian general, Akbah, conquered the coast towns of Tripoli, founded Cairo, and extended his sway almost to the desert. Hassan, the general of the calif Abd-el-Malek, in 692, stormed, plundered, and destroyed the new Carthage, and, in fact, annihilated the Greek-Roman dominion in Africa. In the course of less than a century, the greater part of the native tribes were converted forcibly to the faith of Islam. In 789, the western provinces separated themselves from the others, and Edris-ben-Abdallah founded there the dynasty of the Edrisites. After 800, when the governor, Ibrahim-ben-Aglab, declared himself independent, and founded the dynasty of the Aglabites, Africa was lost to the califs. From this time down to 1269, the changes of dynasty in B. were so frequent, that we cannot here describe them in detail. The results were, that independent states arose in Algeria, Oran, Bugia, Tenez, etc. About this time, also, began the reaction of the Christian world against Mohammedanism in North Africa and Spain. St. Louis undertook an expedition against Tunis. The Moors were, by and by, expelled from Spain, and settled themselves on the coast of northern Africa, there to begin that course of piracy by which they became odious to Europe, first as a fierce retaliation against their Christian persecutors, but ultimately as a barbarous profession. As early as the time of Ferdinand the Catholic, the Spaniards sought to check their insolent ravages, and landed in Africa on several occasions, capturing the ports of Ceuta, Melilla, Oran, Bugia, the island before Algiers, and Tripoli. The Portuguese landed on the coast of Morocco, where at first they had great success, but they were ultimately compelled to leave the country. After various changes of fortune, Algiers, Tunis, and Tripoli were brought under the government of the sultan. Since 1830, however, the first of these (see ALGERIA) has been under French sway, while for many years the other two have been only nominally dependent on the Turkish ruler. A similar fate, at a much earlier period, befell the western part of B., where the successors of the Arabiah sherif, Mula-Mehemed, overthrew the kings of Morocco and Fez, and established the Sherif dynasty, which rules to the present day over these lands.—Shaw's *Travels and Observations relative to several Parts of B.;* Mauroy, *Du Commerce des Peuples de l'Afrique Septentrionale* (Par. 1845).

BARBARY APE, PIGMY APE, or MAGOT, a small species of ape or tailless monkey, interesting as the only one of the monkey-race which is found in Europe. The only European locality, however, in which it occurs is the rock of Gibraltar, and it is said to have been originally brought from the n. of Africa. It inhabits the precipitous sides of the rock, inaccessible to human foot, and enjoys a certain measure of protection from firearms in return for the amusement afforded by its manners. It is gregarious, and large numbers are often seen together, the females carrying their young upon their backs. In some parts of the n. of Africa, the B. A. is extremely abundant, inhabiting rocky mountains and woods. It displays great agility in passing from tree to tree, and its bands often plunder gardens, one of their number keeping careful watch. It feeds on fruits, roots, etc.; and its fondness for eggs is supposed to have given rise to the ancient story of the battle of the pigmies and the cranes. It is of a greenish-gray color, paler underneath; and in size resembles a large cat. The characters agree with those of the genus *macacus* (Wanderoo monkey, q.v., etc.), except that the tail is reduced to a mere tubercle. The muzzle is somewhat elongated, although not nearly so much as in the baboons, with which this ape has sometimes been classed, and the facial angle is much higher than in them. The face is almost naked, and somewhat wrinkled. The ears are in form not unlike human ears. The eyes are round, reddish, and of great vivacity. The B. A. is one of the monkeys most frequently to be seen in captivity, at least in Britain; and possessing a considerable degree of intelligence, is capable of being trained to many tricks. In order to this, however, it must be taken young, as the older ones are often sullen and mischievous. It usually walks on four feet, although it can be trained to stand or walk, in a more awkward manner, on two. It is filthy in its habits.

BARBASTELLE. See BAT.

BARBAS'TRO, a walled t. of Spain, in the province of Aragon. It is situated on the Vero, has a cathedral with some paintings by Antonio Galceran. Pop. 6500.

BAR'BAULD, ANNA LETITIA, an English authoress, was b. at Kibworth-Harcourt, in Leicestershire—where her father, the Rev. John Aikin, a dissenting clergyman, kept an academy—on the 20th June, 1743. Her private education, the religious influence of her home, and secluded life in the country were well fitted to develop early her natural taste for poetry; but it was not until 1773 that she was induced to give her effusions to the public, who appreciated them so highly that four editions were called for during the year. Encouraged by this, she the same year, conjointly with her brother, published *Miscellaneous Pieces in Prose* (Lond. 1773), which also passed through many editions.

In the following year, the poetess married the Rev. Rochemont Barbauld, a dissenting minister at Palgrave, in Suffolk, in which village the newly married pair opened a boarding-school for boys. The literary fame and the assiduity of Mrs. B. soon made it celebrated. During the ten years Mrs. B. was engaged in the duties of tuition here, she published *Early Lessons for Children*, and *Hymns in Prose*, works which have been often reprinted in England for youthful readers, and translated into several languages. Her *Devotional Pieces* was also published during this period. In 1792, she commenced with the brother previously mentioned—who wrote the most of them—the well-known series, *Evenings at Home*, which were completed in three years. In 1795, she edited Akenside's *Pleasures of Imagination*, and Collins's *Odes*, prefixing to each a critical essay. In 1804, she began to edit a selection from the *Spectator*, *Guardian*, *Tatler*, etc.; and in 1810 published a collection of the British novelists, the task of editing which she had undertaken to divert her mind from the loss she had sustained two years previous in the death of her husband. *The Female Spectator* (Lond. 1811) contains a selection from her writings. Her last poetical effort was an ode, entitled *Eighteen Hundred and Eleven* (Lond. 1812). All her compositions are characterized by simplicity of feeling, an easy, flowing style, and pure and elevated sentiment, and give token of a mind well versed in classical literature. She lived in quiet retirement till her death, which happened on the 9th Mar., 1825. The life of Mrs. B. has been written by Lucy Aikin, also known as an authoress, and prefixed to the collection of the *Works of A. L. Barbauld* (2 vols., Lond. 1825). The same lady also published from the posthumous papers of the authoress, *A Legacy for Young Ladies* (Lond. 1826).

BARBED and **CRESTED**, heraldic terms, by which the comb and gills of a cock are designated, when it is necessary to particularize them as being of a different tincture from the body. The common English term is *wattled and combed*, gules, or whatever else the tincture may be.

BARBEL, *Barbus*, a genus of fishes of the family of the *cyprinidæ* (q.v.), differing from *cyprinus* (carp, gold-fish, etc.) in the short dorsal and anal fins, in having one of the rays of the dorsal fin strong and serrated, and the mouth furnished with four soft barbules (whence the name B., from Lat. *barba*, a beard), two near the point of the snout, and one at each angle of the mouth. The upper jaw also extends considerably beyond the lower. The species are numerous. Like the other cyprinidæ, they are all inhabitants of fresh water, and generally of muddy ponds and rivers, where they seek food by plowing up the mud with their snouts, like swine, and are said often to seize the small fishes which come to share with them the worms and insects of the mud. They also feed upon the leaves and roots of aquatic plants.—The common B. (*B. vulgaris*) is abundant in many of the rivers of the temperate parts of Europe. It is the only species found in Britain, and only in some of the still and deep rivers of England. It is very abundant in the Thames, frequenting the weedy parts of the river in shoals in summer, and seeking the deeper water in winter, becoming so torpid during cold weather, that the fishermen sometimes take it with the hand, or by pushing it with a pole into a small net fastened to an iron hoop. It grows to a large size, sometimes 3 ft. in length, and 15 to 18 lbs. in weight; it is rather of a long shape, in section nearly circular: the general color of the head and upper part of the body greenish-brown, becoming yellowish-green on the sides, the belly white, the tail somewhat forked, and of a deep purple color. It affords sport to anglers, but is a very coarse fish, and little used for food, except by the poor, who often boil bacon with it to give it a relish. The larger barbels are esteemed the best. The roe has poisonous qualities, although its effects are disagreeable rather than permanently injurious.

Another species, called the binny, or B. of the Nile, is very abundant in that river; attains a very great size, 70 lbs. or upwards; is much esteemed for food; and is taken by hooks bated with dates steeped in honey. A number of baited hooks, each attached to a separate strong line, are inclosed in a mass of clay, flour, dates, etc., which is sunk in the river, and to which, as it begins to dissolve, the binnies are attracted; when boring into it with their snouts, and devouring the dates, they are caught. The fish being generally hooked by the projecting upper jaw, is allowed to remain in the water, the line being fastened on shore, and is taken out when wanted for immediate use.

BARBEL, ANGLING FOR. The B. is a ground-feeding fish, grubbing on the bottom for his sustenance. The baits principally used to capture him are worms and maggots, greaves, and cheese; and the means of angling for him are chiefly with a dead-line, called a ledger, or with float-tackle. The ledger is a perforated leaden bullet; through this the line runs freely. To prevent its slipping down on the hook, a large shot or other substance is fastened on the line, about a yard above the hook. The hook (about No. 5 or 6 in size) is baited either with a lob-worm or greaves, and the lead is cast into the water, and remains motionless on the bottom. When a fish bites, the angler feels the tug, and strikes smartly; as the fins of the B. are large, and his muscles powerful, he frequently offers considerable resistance. The rod used for ledger-fishing is short and stiff. In float-fishing for B., the tackle is finer, and the hook smaller. A cork-float suited to the depth and rapidity of the river is used, and it is fixed at such a height upon the line that the bait just touches the bottom. The instant the float disappears, the angler strikes, but not so forcibly as in ledger-fishing. Previous to angling for B., it is

desirable to bait the place to be fished, for the purpose of drawing the fish together. This is accomplished by chopping up and casting into the water from 500 to 1000 lob-worms, and it should be done 18 or 20 hours before fishing. In float-fishing for B., the float should be allowed to travel down a considerable distance of water, at least 30 or 40 yards, in order that no spot where a portion of the worms may have lodged should be missed. This is sometimes done by the use of a float called a slider, which is not fixed on the line, but, by the management of the angler, accommodates itself to the depth of the water. In this fishing, the bait trails along the ground, and the rod should be at least 14 or 15 ft. in length, and the line very light and fine. B. will sometimes take a spinning bait, and are often caught by the angler while trout-fishing; but this is by no means a certain method of angling for them. The B. may be said to be gregarious; it spawns in May or June, choosing some gentle shallow for that purpose, but soon recovers its strength again. About the end of July, the B. seeks the deep rapid streams, and may be seen vigorously springing from the water in his endeavors to rid himself of the parasitical insects which attach themselves to him during his quiescence. Here he remains the greater part of the summer and autumn. Frosty weather renders the B. torpid, and he takes shelter under some large stone or weed, where he can lie up during the winter. Although the B. is by no means an estimable fish for the table, it is much used by the Jews in their fasts and festivals.

BARBÉ-MARBOIS, François de, 1745–1837; a French statesman. He was consul-general of France for the United States, where he wedded a daughter of Wm. Moore, of Pennsylvania. In 1785, he was governor of San Domingo, where he made many reforms. In 1797 he was exiled to Guiana for political reasons, but recalled in 1801 and made minister of finance. He negotiated the sale of Louisiana to the United States, and got for it 25,000,000 francs more than Napoleon really asked, for which he was liberally rewarded. He was a member of the senate in 1813, and favored the restoration of the Bourbons, for which Louis XVIII. made him a peer of France. After the overturn of July he swore fealty to Louis Philippe. Among his works are *Reflexions sur la Colonie de Saint-Domingue, Complot d'Arnold et de Sir Henry Clinton contre les Etats-Unis d'Amerique et contre le Général Washington, De la Guyane,* and *History of the Cession of Louisiana to the United States.*

BARBER (Lat. *barba,* the beard), a shaver of the beard, and who ordinarily includes hair-cutting in his profession. Barbers are of great antiquity, if not for the shaving of the beard, at least for shaving a portion of the head. The office of the B. is referred to by the prophet Ezekiel: "And thou, son of man, take thee a barber's razor, and cause it to pass upon thine head and upon thy beard."—Ezek. v. 1. In all oriental countries, including China, the shaving the whole or part of the head continues to be performed by barbers. In every part of the world, the professional B. and hair-dresser is celebrated for his garrulity and general obliging qualities, such being required by those who place themselves in his hands. The amusing character of the B. in one of the tales in the *Arabian Nights Entertainments,* and also of the B. in Rossini's opera of *Figaro,* will readily occur to recollection. As will be seen from the succeeding article, barbers at one time acted as a kind of surgeons, and accordingly occupied a higher social position than they now enjoy. Latterly, on account of the simple mode of trimming the hair, and of the prevalence of private shaving, the business of the B. in England has greatly declined, and his services are chiefly confined to the humbler classes. In the United States, the business of the B. is almost exclusively in the hands of the colored population. Anciently, one of the utensils of the B. was a brass basin, with a semicircular gap in one side to compass a man's throat, by which means, in applying the lather to the face, the clothes were not soiled. Readers will recollect that Don Quixote crazily assumed a barber's basin as a helmet. At the end of a pole, the brass basin is still hung out as a sign at the door of the B. in Great Britain, France, and other countries.

BARBER, Francis, 1751–83; an American revolutionary colonel, graduate of the college of New Jersey, and one of Alexander Hamilton's preceptors. He volunteered when the war began, was in several engagements, was severely wounded at Monmouth, and again at Newtown. At the time of the mutiny of the Pennsylvania and New Jersey troops, B. was successful in speedily suppressing the revolt. In the autumn of 1783, on the day that he was invited by Washington to come to Newburg and hear the news of peace, B. was killed by a tree falling upon him. His brothers John and William were officers in the New Jersey line.

BARBERI'NI, the name of an Italian family who settled in Florence in the 11th c., whose members were for 500 years foremost among traders, besides figuring largely in high offices. In 1623, Maffeo B. became pope Urban VIII.; his brother Antonio and two nephews were made cardinals, and his brother Carlo general of the papal forces. Carlo was succeeded in the command by his son Taddeo, the husband of Anna Colonna. Taddeo became prefect of Rome after the death of the duke of Urbino, whose possessions were added to the papal territories. Other Italian princes became jealous of the B. family, and made war upon and defeated Taddeo's papal forces. Urban's successor, Innocent X., became hostile to the Barberini, and Taddeo fled to Paris, where he died. The principality of Palestrina still belongs to the family, and their magnificent palace and library in Rome attest their vast wealth and magnificence.

BARBERI'NO-DI-MUGEL'LO, a t. of Tuscany on the Siere, 15 m. n. of Florence, with a pop. of 5000, engaged in the manufacture of straw-hats. The royal villa of Caffegiolo, the ancient residence of the Medicis, stands in the environs.—B. Di Val-d'Elsa, a village in the same district, with a beautiful situation on the ridge between the valleys of the Pesa and Elsa, and celebrated as the place where pope Urban VIII. was born. One of the palaces of the Barberini is here.

BARBERRY, *Berberis*, a genus of plants, of the natural order *berberideæ* (q.v.). All the species, which are numerous, and found in temperate climates in most parts of the world except Australia, are shrubs with yellow flowers, having a calyx of six leaves, a corolla of six petals, and six stamens, which, when touched at the base, display a considerable degree of irritability, starting up from their ordinary position of reclining upon the petals, and closing upon the pistil apparently a provision to secure fecundation. The fruit is a berry with two or three seeds. Not a few of the species are evergreen. They are divided into two sub-genera, sometimes ranked as genera; those with simple leaves forming the sub-genus *berberis*, and those with pinnate leaves the sub-genus *mahonia*, or ash-leaved B.—The common B. (*B. vulgaris*) is a native of most of the temperate parts of Europe, Asia, and North America. It produces its flowers and fruit in pendulous racemes; has obovate, slightly serrate, deciduous leaves; and numerous straight three-forked spines. It is a very ornamental shrub, especially when covered with fruit. Its berries are of an elongate oval form; when ripe, generally of a bright red color, more rarely whitish, yellow, or almost black. They contain free malic acid. The fruit of the ordinary varieties is too acid to be eaten, but makes excellent preserves and jelly. Malic acid (q.v.) is pretty extensively prepared from it in France. A yellow fungus, *æcidium berberidis*, is very general upon the under-side of the leaves of the B.; and a notion prevails that it produces *rust* in corn, which is erroneous, the rust (q.v.) of corn being a totally different fungus, which, like this, is apt to appear in humid weather. The prevalence of this notion, however, appears to have prevented the general employment of the B. as a hedge-plant, for which it is admirably adapted, hedges made of it being easily kept free from gaps, and becoming more and more impervious by new shoots thrown up from the root. The yellow root of the B. is used for dyeing yellow, and especially the inner bark of it, and also of the stem and branches. The bark is capable of being employed for tanning leather. In like manner, *B. glauca*, *B. ilicifolia*, *B. tomentosa*, and *B. lutea* are used for dyeing in Chili and Peru; *B. tinctoria* by the inhabitants of the Neilgherry hills, and *B. aristata* in Nepaul; and a strong similarity of properties appears to pervade the whole genus. *B. lycium*, a native of the n. of India, is characterized by great astringency, and an extract prepared from it is valuable in ophthalmia. Most of the species are more or less spiny, and some of the evergreen species might be very ornamentally employed for hedge-plants; as *B. dulcis*, now frequent in shrubberies in Britain. This species, sometimes called the sweet B., is a native of the s.w. coast of America. Its leaves much resemble those of the common B.; it has solitary flowers on rather long stalks, and globose black berries about the size of a common black currant. The fruit is produced very copiously in Britain, is quite sweet when fully ripe, and makes excellent jelly. When unripe and very acid, it is used for tarts. Pleasant fruits are produced also by *B. aristata* and *B. Asiatica*, the berries of both of which are dried in Nepaul, after the manner of raisins; *B. concinna*, also a Himalayan species; *B. microphylla*, found in the southern parts of South America; and *B. trifoliata*, found in Mexico. Those of some of the other species are either disagreeable or insipid, which is particularly the case with most of the ash-leaved barberries, natives of North America and the n. of India.—Numerous species of B., both from the Himalaya and South America, are daily becoming more frequent in Britain as ornamental shrubs.

BARBER-SURGEONS. In former times, as stated in the foregoing article, barbers acted as a kind of surgeons, or at least phlebotomists, and such appears to have been the case in all countries. Till this day, on the pole on which the barber's basin is suspended, there is represented a twisted or spiral ribbon, which symbolizes the winding of a ribbon round the arm previous to blood-letting. In London, Edinburgh, and elsewhere, the B. formed corporations with certain privileges. The surgical duties of these bodies now pertain to the corporations of surgeons. The existence of B. as professors of the healing art, in England, can be traced as far back as the rign of Edward IV. in 1461, when they were first incorporated; and from thence till the reign of Henry VIII., when they were united with the surgeons, until the time of George II., when the B. ceased to be anything but barbers, as we now understand the term. In the latter reign, an act was passed, the 18 Geo. II. c. 15, from the preamble of which we learn that not till then had the discovery been made that the business or trade of a barber was "foreign to, and independent of, the practice of surgery;" and it therefore proceeds to dissolve the connection between the two bodies, and to remit the B. to the more humble functions they now perform. But this is done with an express saving of all their privileges as a company or corporation, and as such they exist to the present day. See an interesting account of them in Knight's *History of London*, vol. iii. pp. 177–192, which concludes with the following curious extract from the list of officers to Heriot's hospital in the statutes of that charity compiled in 1627: "One chirurgeon barber *who shall cut and pole the hair of all the scholars of the hospital;* and *also* look to the *cure* of all those within

the hospital who *anyway* shall stand in need of his *art*." And see the report of the royal commissioners appointed to inquire into the corporations of London, and printed in 1837, in which all particulars relating to the government and working of this company at the present day are given. The report states that the company exists "for using and exercising the art and mystery of barbers, which includes hair-dressers within the suburbs and liberties of the city;" and it concludes as follows: "The company possess extensive powers for the regulation of the trade, but in practice none are exercised except the power of compelling all persons using the trade or business of barber (which, as before mentioned, includes hair-dressers) within the city to become free of the company." The barbers still retain their ancient hall—which they possessed before the surgeons were disunited from them—in Monkwell street, Cripplegate, in the city of London. See APOTHECARIES, SURGEONS, TRADE CORPORATIONS.

BARBÈS, ARMAND, 1809–70; a French revolutionist, and leader in secret political societies, at various times imprisoned, and in 1839 sentenced to death as the main leader of an insurrection in which a lieutenant was murdered; but he was spared. While in prison he wrote *Two Days under Condemnation of Death*. In 1848, he was chosen to the constituent assembly, and in the same year, with Raspail and others, he was sentenced to life-imprisonment. When set free he refused to receive pardon, asking to be allowed to return to jail, but this was denied him, and he left the country.

BARBET, *Bucco*, a genus of birds generally placed by ornithologists in the family of the *Picidæ*, or woodpeckers (q.v.), but regarded as the type of a very distinct sub-family, exhibiting points of resemblance to the cuckoos. They have a large conical beak, surrounded with tufts of bristles directed forwards—a characteristic from which the name B. is derived (Lat. *barba*, a beard). They prey on insects, and some of them also on young birds; some are at least partially frugivorous. They inhabit warm parts both of the eastern and western hemispheres, and most of them are birds of gay plumage. The Linnæan genus has been subdivided, and includes, besides the true barbets, the barbacous (*monasa*), South American birds—the barbicans (*pogonias*) of Africa and India—the American puff-birds (*tomatia*), etc. The puff-birds are remarkable for erecting their plumage till they resemble a round ball. Being birds of short wing, both they and the true barbets wait for their prey, generally sitting with great patience on some withered branch till it comes near them, when they suddenly dart upon it. They often choose positions close to human habitations, and show little fear.

BARBETTE, an earthen terrace inside the parapet of a rampart, serving as a platform for heavy guns; it has such an elevation that the guns may be fired over the crest of the parapet instead of through the embrasures, to give them a freer scope by swiveling round into different directions.

BARBEYRAC, JEAN, 1674–1744; a French writer on law, the son of a Protestant minister expatriated by the revocation of the edict of Nantes. B. taught in Lausanne and Berlin, and was professor of international law in Groningen. His fame rests chiefly on the preface and notes to his translation of Puffendorf's *De pure Naturæ et Gentium*. He also translated Grotius' *Law in War and Peace*. Among his own works are a *History of Ancient Treatises*, and *Traité du Jeu*, in which he defends the morality of games of chance.

BARBICAN (Ital. *barbacáne*), a projecting watch-tower, or other advanced work, before the gate of a castle or fortified town. The term B. was more specially applied to the outwork intended to defend the drawbridge, which in modern fortifications is called the *tête du pont*. "To begin from without, the first member of an ancient castle was the B., a watch-tower, for the purpose of descrying an enemy at a greater distance" (Grose's *Antiquities of England and Wales*), and, to the same effect, Camden, speaking of Bedford Castle, says it was taken by four assaults; in the first was taken the B.; in the second, the *outer* balia. See BAILEY. See also Parker's *Glossary of Architecture*. There are a few perfect barbicans remaining in England, as at Alnwick and Warwick; but the best examples of it, as of the other parts of the fortification of the middle ages, are probably to be seen in the town of Carcassone (q.v.). A very curious and minute account of the siege of Carcassone in 1240, in the form of a report to queen Blanche by the seneschal who defended it, preserved in the archives of France, has been published in Hewitt's *Ancient Armour* (p. 355, *et seq.*), in which the uses of the B. are fully illustrated. The street called Barbican in London, near Aldersgate street, marks the site of such a work, in front of one of the gates of the old city.

BARBIER, ANTOINE ALEXANDRE, 1765–1825; a French librarian, who took orders as a priest, but abandoned the church for literature. He collected for the new institutions established in 1794 the books and works of art of the convents previously abolished; in 1798 he was librarian for the directory, and afterwards for Napoleon, making up the libraries of the Louvre, of Fontainebleau, and of Compiegne. Under the restoration he had charge of public libraries until 1822. B. was the author of *Nouvelle bibliotheque d'un homme de goût* and a dictionary of pseudonyms and anonymous writers.

BARBIERI, GIOVANNI FRANCESCO. See GUERCINO, *ante*.

BAR'BITON, or BAR'BITOS, a stringed instrument of the ancient Greeks, made of ivory, in the form of a lyre, with seven strings, and said to have been invented by Anacreon.

BARBOU, the name of a celebrated French family of printers, the descendants of John B. of Lyon, who lived in the 16th century. From his press issued the beautiful edition of the works of Clement Marot in 1539. His son, Hugh B., removed from Lyon to Limoges, where, among other works, his celebrated edition of *Cicero's Letters to Atticus* appeared in 1580. Joseph Gerard B., a descendant of the same family—who in the beginning of the 18th c. settled in Paris—continued in 1755 the series of Latin classics in duodecimo—rivals to the Elzevirs of an earlier date—which had been begun in 1743 by Coustelier, at the instigation of the learned Lenglet Dufresnoy. This series of classics, which is much prized for its elegance and correctness, was purchased, along with the rest of the business, by Delalain, from the heirs of Hugh B., who died in 1809. There is a complete set of the B. classics in the royal library of the British museum.

BARBOUR, a co. in s.e. Alabama, on the Chattahoochie, adjoining Georgia; 900 sq.m.; pop. '80, 34,026—20,921 colored. It is fertile, producing corn, cotton, molasses, and sweet potatoes. Co. seat, Clayton.

BARBOUR, a co. in s. Kansas, on the border of the Indian territory; 1,134 sq.m.; pop. '75, 1,388. It has an undulating prairie surface. Co. seat, Medicine Lodge.

BARBOUR, a co. in n.e. West Virginia; 330 sq.m.; pop. '70, 10,312—386 colored in '80, 11,810. It is hilly, and good for grazing; coal, iron, and salt mines are worked. Co. seat, Philippi.

BARBOUR, JAMES, 1775–1842; a lawyer, member of the Virginia legislature, 1796–1812; governor two terms; United States senator two terms; secretary of war in 1825; minister to England in 1828, but recalled by Jackson. He presided over the national convention that nominated Harrison and Tyler.

BARBOUR, JOHN, an eminent Scottish poet of the 14th c., regarding whom history has not much to record beyond the production of the national epic, entitled *The Bruce*. Nothing is known of his parentage, and of his birth it can only be conjectured to have been about 1320. The ascertained facts of his life are few. We are informed only that in his own age he was accounted a man of great learning and worth; that he was archdeacon of Aberdeen as early at least as 1357, and held that office till his death in 1395; that in 1357 he traveled into England, accompanied by three scholars, for the purpose of studying at Oxford; that he repeated his visit to England for the same purpose in 1364; that in 1365, he obtained a passport "to travel through England with six companions on horseback towards St. Denis and other sacred places;" that in 1368, he again received permission to travel through England with two servants and two horses, on his way for scholarly purposes to France; that in 1373 he was clerk of audit of the household of king Robert II., and one of the auditors of exchequer; that in 1375 his great poem was more than half finished; that in 1377 he had a gratuity of £10 from king Robert II.; that in 1378 he received from the same prince a perpetual annuity of 20s., which in 1380 he bequeathed to the dean and chapter of Aberdeen, under the condition that they should sing a yearly mass for the rest of his soul; that in 1381 he had a gift from the crown of the ward of a minor, whose estate lay within the parish of which he was rector; that in 1383, and again in 1385, he was one of the auditors of exchequer; that in 1388 king Robert II. granted him a pension of £10 a year; and that he died between Martinmas 1394 and Whitsunday 1395, probably on the 13th Mar. of the year last named, his anniversary in the cathedral of Aberdeen being celebrated on that day until the reformation. Besides *The Bruce*, B. wrote two other poems, *The Brute*, now lost, in which he recounted the origin and history of the royal house of Stuart, and *The Book of Legends of the Saints*, recently discovered in Cambridge university library. *The Bruce* is distinguished by great purity and clearness of style, the language and versification contrasting advantageously with those of any contemporary English poet, not excepting even Chaucer. His imagery is not rich, but he is seldom other than lively, simple, and energetic. He has depicted, in rough but faithful outline, the life, manners, and deeds of a truly heroic time, and given to his country the first poem in her literature, and the earliest history of her best and greatest king. *The Bruce* was first printed by Dr. Jamieson in 1820; and edited by Cosmo Innes, for the Spalding club, in 1856. The early English text society also published an edition edited by Rev. W. W. Skeat.

BARBU'DA, one of the British Caribbees, lying 30 m. to the n. of Antigua. Of its n. end, the lat. and long. are 17° 33′ n, and 61° 43′ w. Its area is estimated at 75 sq.m., and the number of its inhabitants in 1871 was 813. The proportional density, therefore, of population is only about $\frac{1}{10}$ of that of Barbadoes (q.v.). In fact, the island, small as it is, has never been cleared for cultivation, the greater part of the interior being a dense forest, interspersed with patches of savanna. The agriculture, such as it is, is confined to the rearing of stock and the growing of provisions. B. is of coral formation, and is beset with reefs. It has a roadstead, but no harbor.

BARBY, a walled t. of Prussian Saxony, on the left bank of the Elbe, 15 m. s.e. of Madgeburg. It is well built, and has an old castle. Pop. '75, 5084, chiefly engaged in the manufacture of woolens and linens.

BARCA, a country in the n. of Africa, in lat. 26° to 33° n., and long. 20° to 25° e., between the Great Syrtis (now called the gulf of Sidra) and Egypt. It forms the eastern division of Tripoli, having the rest of that dominion on the w., the Mediterranean sea on the n., the Libyan desert on the s., and it is separated from Egypt on the e. by no definite line, but by a number of roving independent tribes. It nearly corresponds with the ancient Cyrenaica (q.v.). Pop. variously estimated from 300,000 to 1,000,000. The climate is healthy and agreeable in the more elevated parts, which reach a height of about 1200 ft., and in those exposed to the sea-breeze. There are none but small streams, but the narrow terrace-like tracts of country are extremely fertile, realizing all that is said of the ancient Cyrenaica. Rice, dates, olives, saffron, etc., are produced in plenty. The pastures are excellent; the horses still celebrated, as in ancient times. But the good soil extends over only about a fourth of B.; the e. exhibits only naked rocks and loose sand. Many ruins in the north-western parts attest a former state of cultivation much superior to the present. So early as the time of Cyrus, B. became a state, which proved dangerous to the neighboring state of Cyrene; but within a single century it sank, and became subject to Egypt. In the Roman period, its inhabitants were noted for their predatory incursions. It was afterwards a province of the Greek empire, and had declared itself independent when the Arabs invaded and conquered it in 641. The present inhabitants consist of Arabs and Berbers, who profess the Mohammedan religion, and are subject to the Pasha of Tripoli, to whom each of the beys pays an annual tribute.

BARCA, or BARCE, an ancient city in Cyrenica, in the district of B., Africa, the ruins now being known as El-Medinah. It was on high ground, about 11 m. from the sea, founded by a Cyrenean colony about 554 B.C. The Persians captured and pillaged the city about 510 B.C., and many of its people were led as captives into Bactria. B. existed for several centuries after the Christian era, and appears to have risen to importance under the Arabs.

BARCA, or BARCAS, signifying "lightning," applied to Hamilcar and other Carthaginian commanders, because of the rapidity of their military movements.

BARCAROLLE', a species of song peculiar to the gondoliers of Venice. The name is applied to musical compositions for voice or pianoforte of a similar character.

BARCELLO'NA and **POZ'ZO DI GOT'TO**, two towns of Sicily, in the province of Messina, standing close together, so as really to form one t., the two parts of which are separated by a small stream, the Fiume di Castro Reale, supposed to be the Longanus of antiquity. Pop. of the two towns, 14,471. The chief street is a long street of mean houses of a single story. B. is situated in a broad plain, between the mountains and the sea, abounding in corn, wine, oil, and fruit. It is 22 m. w.s.w. from Messina.

BARCELO'NA, the most important manufacturing city in Spain, in the province of the same name, is beautifully situated on the Mediterranean between the mouths of the Llobregat and the Besos, in the midst of a district as luxuriant as a garden. It is walled, and possessed of a citadel, which, however, is effectually commanded by the fortress of Montjouy on the southwest. B., like Edinburgh, is divided into two parts—the old town and the new—by the *rambla* (river-bed), which has been planted with flowering shrubs, and formed into a beautiful promenade. The streets of the old town, forming the n.w. division, are crooked, narrow, and ill-paved. Those of the new are much more spacious and regular. There is a large suburb to the e. of the town, where the seafaring portion of the population chiefly reside. In 1864, the pop. was 190,000; but in 1868 it had been reduced to 167,095; chiefly by a frightful cholera epidemic in 1865. B. is the see of a bishop. It has a university, and colleges and schools for general and special educational purposes; public libraries, in one of which there is a splendid collection of MSS.; several hospitals and other charitable institutions; the finest theater in Spain; and numerous ancient and elegant churches, with a cathedral which, begun in 1298, is not yet completed. B. manufactures silk, woolens, cottons, lace, hats, firearms, etc., which form its principal exports. It imports raw cotton, coffee, cocoa, sugar, and other colonial produce: also Baltic timber, salt-fish, hides, iron, wax, etc. Next to Cadiz, it is the most important port in Spain. In 1872, between 700 and 800 foreign vessels, with a tonnage of 360,000 tons, discharged their cargoes in the port. The harbor was extended and its entrance improved in 1875. The imports in 1874 amounted to £1,943,310, and the exports to about £300,000. B. is a place of great antiquity, and associated with many historical events. Local tradition fixes the date of its foundation 400 years before the Romans; and it is said to have been refounded by Amilcar Barca, the father of Hannibal, from whom its ancient name, Barcino, was derived. An important city under the Romans, Goths, and Moors, B. in 878 became an independent sovereignty, under a Christian chief of its own, whose descendants continued to govern it, and to hold the title of counts of Barcelona until the 12th c., when its ruler adopted the title of king of Aragon, to which kingdom it was annexed. During the middle ages, B. became a flourishing seaport, rivaled in the Mediterranean by Genoa only. To its commercial code, framed in the 13th c., much deference was paid by the whole of Europe; and it was at this time, says Ford in his *Handbook of Spain*, "a city of commerce, conquest, and courtiers; of taste, learning, and luxury; and the Athens of the troubadour." Columbus was received here in 1493 by Ferdinand and Isabella after his discovery of America. In

1640, it appealed to France against the tyranny of Philip IV.; but it turned against that country in the war of the Spanish succession, and adhered to Austria. In 1705, the fortress of Montjouy was surprised and captured by lord Peterborough, and the city surrendered shortly afterwards. In 1714, after a most heroic defense, it was stormed by the duke of Berwick, and given over to fire and sword. Napoleon perfidiously obtained possession of it in 1808; and with one or two reverses, and in the face of great difficulties, it was held by the French until the treaty of peace concluded in Paris in 1814. For 13 years, B. remained quiet under the iron rule of España; but in 1827 its old turbulent spirit returned, and it rose in favor of Don Carlos. Since that time, B. has generally supported the government. But a progressist rebellion in 1856 caused much bloodshed, and in 1874 the federalists raised an insurrection here.—The province of B. has an area of 2950 sq.m., and a pop. of (1870) 762,555.

BARCELO'NA, a state or department of Venezuela, between the Caribbean sea and the Orinoco; 13,812 sq.m.; pop. '73, 101,396. Besides many cattle, it produces coffee, cocoa, cotton, cane, corn, and tropical fruits.

BARCELO'NA, formerly NEW B., the capital of the state of B. on the Neveri, near the ocean, 160 m. e. of Caraccas; pop. 7644. The city is dirty and unhealthy, yet has considerable export trade in hides, cattle, indigo, cotton, etc.

BARCLAY, ALEXANDER, a poet and prose writer, b. about the end of the 15th c., whether in England or Scotland is not certain. He studied at Oxford, and then obtained through his patron, bishop Cornish, an appointment as one of the priests or prebendaries of St. Mary Ottery, in Devonshire. He afterwards became a monk of the Benedictine monastery of Ely, where he continued until its suppression in 1539. He d. in June, 1552, six weeks after he had been presented to the rectory of All-Hallows, London. His claim to notice rests chiefly upon his famous poem, *The Shyp of Folys of the Worlde*—partly a translation, and partly an imitation of the German *Narrenschiff* by Brandt—printed by Pynson in 1509, and since often reprinted (best edition by T. H. Jamieson, 1874.) It is interesting as showing the manners and customs of the times satirized. He published several works besides; amongst others, *The Myrrour of Good Manners*, *The Castell of Labour*, *The Egloges*, the first eclogues that appeared in the English language; and also made a translation of Sallust's *History of the Jugurthine War*. In his lifetime, he was admired for his wit and eloquence, and his writings exhibit a refinement not common in that age.

BARCLAY, JOHN, a clever poet and satirist, was b. about 1582, at Pont-à-Mousson in Lorraine, where his father, William B., a Scotsman, who d. in 1605, had held the office of professor of law. He studied in the Jesuit college of that place; and the distinguished talents which he early displayed, caused the Jesuits to try to induce him to enter their order. On account of his rejection of their proposals, he, as well as his father, suffered much persecution. He accompanied his father to England in 1603, where he soon attracted the attention of James I., to whom he dedicated one of his works, *Euphormionis Satyricon* (Lond. 1603), a politico-satirical romance, chiefly directed against the Jesuits. Next appeared his *Conspiratio Anglicana* (Lond. 1605), and his *Icon Animarum* (Lond. 1614). In 1615, he left England, and went to Rome, where he d. Aug. 12, 1621. In the same year his celebrated work *Argênis* appeared in Paris (Paris, 1621). It was written in Latin, and has been translated into several languages. There are no fewer than three translations into English; the last appeared in 1772. It is a political allegory, containing clever allusions to the state of Europe, more particularly of France, during the time of the league. *Argênis* was admired both by Cowper and D'Israeli.

BARCLAY, JOHN, 1734–98; the founder of a small sect in the Scotch church called Bereans, or Barclayites. He was assistant minister at Fettercairn, where he attracted crowds by his novel doctrine; the presbytery disapproving refused him the usual testimonials, and he was dismissed from his position. The general assembly sustained the presbytery, whereupon B. left the church, but continued to preach in Edinburgh, London, and other cities, but with no great success. The Bereans claim to found their system upon the gospel alone, without reference to human authority. As a sect they are not important in number or influence.

BARCLAY, JOHN, M.D., lecturer on anatomy in Edinburgh, and eminent for his attainments both in human and comparative anatomy, in physiology, and in other branches of natural science, was b. Dec. 10, 1758, at Cairn, near Drummaquhance, in Perthshire, Scotland, and was educated at the parish school of Muthil, and afterwards at the university of St. Andrews. He studied for the ministry of the church of Scotland, and was licensed as a preacher, but afterwards devoted himself to the profession of medicine, and particularly to the study of anatomy. He obtained the degree of M.D. from the university of Edinburgh in 1796. After spending a year in London, he became a private lecturer on Human and Comparative Anatomy in Edinburgh. He published in 1803, *A New Anatomical Nomenclature;* and in 1808, a treatise on the *Muscular Motions of the Human Body*. In 1812, appeared his *Description of the Arteries of the Human Body*, a work of vast labor and accurate observation. In 1825, not long before his death, he published *An Inquiry into the Opin-*

tions, Ancient and Modern, concerning Life and Organization. He d. at Edinburgh on 21st Aug., 1826, leaving to the royal college of surgeons in Edinburgh his admirable anatomical collection, for the reception of which a suitable and splendid hall was erected.

BARCLAY, ROBERT, the celebrated apologist of the Quakers, was born on Dec. 23, 1648, at Gordonstown in Morayshire, Scotland. His father was the son of David Barclay of Mathers, the representative of an old Scoto-Norman family, which traced itself through 15 intervening generations to Walter de Berkeley, who acquired a settlement in Scotland about the middle of the 12th c.; his mother was the daughter of sir Robert Gordon, the premier baronet of Nova Scotia, and historian of the house of Sutherland. Young B. received the rudiments of learning in his native country, and was afterwards sent to the Scotch college at Paris, of which his uncle was rector. Here he made rapid progress in his studies, and excited the admiration of his preceptors, as well as of his relative, who offered to make him his heir, if he would remain in France, and formally adopt the Roman Catholic religion, to the ceremonies of which he had been habituated during his residence there. This, however, B. refused to do; and in compliance with the wish which his mother had expressed on her death-bed, he returned home in 1664. Though only 16, B. was an excellent scholar, and could speak in the Latin language with wonderful fluency and correctness. In 1667, he embraced the principles of the society of Friends, for reasons more highly respected in our day than in his. He states in his *Treatise on Universal Love*, that his "first education fell among the strictest sort of Calvinists," those of his country "surpassing in the heat of zeal not only Geneva, from whence they derive their pedigree, but all the other so-called reformed churches;" that shortly afterwards, his transition to France had thrown him among the opposite "sect of Papists," whom, after a time, he found to be no less deficient in charity than the other; and that, consequently, he had refrained from joining any, though he had listened to several. The ultimate effect of this was to liberalize his mind, by convincing him of the folly and wickedness of religious strife. In both Calvinists and Catholics, he found an absence of "the principles of love," "a straitness of doctrine," and a "practice of persecution," which offended his idea of Christianity, as well as his gentle and generous nature. He therefore allied himself gladly to this new sect, whose distinguishing feature was its charity and pure simplicity of Christian life, and soon became one of its most devoted adherents and its ablest advocate. In the course of his life he made several excursions into England, Holland, and Germany, earnestly propagating his peaceful views wherever he went, and occasionally enjoying the companionship of William Penn. His first publication was *Truth Cleared of Calumnies.* It appeared in 1670, and was intended as a refutation of the charges—many of them notoriously false—made against the new sect. In 1673 appeared *A Catechism and Confession of Faith*, the answers to the questions being—to avoid theological dogmatism—in the words of Scripture. This was followed by *The Anarchy of the Ranters*, etc. In 1675, he published his *magnum opus*, elaborately entitled *An Apology for the True Christian Divinity, as the same is held forth and Preached by the People called in scorn Quakers: Being a full Explanation*, etc. It contains a statement and defense of 15 religious propositions peculiar to the Friends. The leading doctrine which runs through the whole book is, that divine truth is made known to us not by logical investigation, but by intuition or immediate revelation; and that the faculty, if it can be technically defined, by which such intuition is rendered possible, is the "internal light," the source of which is God, or, more properly, Christ, "who is the light that lighteth every man that cometh into the world." The identity of this doctrine with that held by Mr. Maurice and others of the Broad church in the present day has been more than once remarked. In 1677 appeared his *Treatise on Universal Love.* It was the first of that long series of noble and gentle remonstrances against the criminality of war that has so honorably distinguished the society of Friends. It was addressed to the ambassadors of the several princes of Europe, met at Nimeguen. In 1686, he published his last work, which was a defense of the doctrine of "immediate revelation." He died at Ury, in Kincardineshire, Oct. 3, 1690. His estate remained in the possession of his descendants till 1854, its owner at that time being captain Barclay, the famous pedestrian. "The Apologist's Study," which remained much as he left it, was long an object of pilgrimage with members of the society of Friends; it was destroyed a few years ago, when the old house of Ury was pulled down.

BARCLAY, WILLIAM, LL.D., 1541–1605; a Scotch writer on law. He studied in France, under the famous Cujas; became professor of civil law in the university of Pont-à-Mousson, and was made councilor of state by the duke of Lorraine. He married a French lady, and their son John became celebrated as the author of the *Argenis.* This boy the Jesuits desired to educate, but the father opposed it, which roused the enmity of the Jesuits so that B. was compelled to leave France. King James offered him preferment if he would join the church of England, but he refused and returned to France, becoming professor in the university of Angers. He was the author of a number of important works on law.

BARCLAY AND PERKINS'S BREWERY, one of the largest establishments of the kind in the world, is situated in Park street, Southwark, London, the buildings covering upwards of ten acres. The brewery was founded by Dr. Johnson's friend, Henry Thrale, who, in 1773, according to a statement made by the doctor on his

Hebridean tour, was paying as much as £20,000 annually to the excise. After Thrale's death, it was sold by the executors to Barclay (a descendant of the author of the *Apology for the Quakers*), and Perkins, who had been Thrale's chief clerk, for £135,000. So far back as the year 1841, when described in Dodd's *Visits to Factories*, this great establishment had 24 malt-bins, each as large as a three-storied house; a brewing-room nearly as large as Westminster hall; 10 coppers averaging 120,000 gallons capacity each; 4 fermenting vessels of 1500 barrels capacity each; a cooling-floor of 1000 sq. yards area; 300 yeast-working vessels of 300 gallons capacity each; and 150 store-vats, one large enough to contain 100,000 gallons. The operations consumed 2000 quarters of malt and 600,000 gallons of water weekly; while the carting of the beer employed 200 horses and drays. These quantities must have greatly increased since; for although there has been a vast increase of population since 1841 in the metropolis, the number of porter breweries (of which those of Barclay & Perkins, and Truman & Hanbury, are the chief) remains nearly uniform.

BARCLAY, or BARCLAY-ALLARDICE, ROBERT, 1779–1854; a captain in the British army, and a descendant of Barclay of Ury; noted as a pedestrian, at his greatest effort walking 1000 m. in 1000 consecutive hours. In later life he was a breeder of cattle and sheep.

BARCLAY DE TOL'LY, MICHAEL, Prince, one of the most distinguished Russian generals, was descended from a branch of the same Scotch family to which the two preceding—Barclay the poet and the apologist of the Quakers—belonged, some of whom had settled in Mecklenburg and Livonia. He was the youngest of three brothers, and was b. in 1759 in Livonia, where his father, Gottlieb B. de T.—at one time a member of the town-council of Riga—possessed an estate. Having been adopted by gen. van Vermoulen, B. de T. entered a Russian regiment of cuirassiers, at first with the rank of sergeant. He fought with great bravery in the Turkish war of 1788–89; in the campaign against Sweden in 1790; and in those against Poland in 1792 and 1794. In the year 1806, at Pultusk, as maj. gen., he commanded Benningsen's advanced-guard. He lost an arm at the battle of Eylau. Although much hated by the Russian national party, because regarded by them as a German, he was appointed minister of war by the emperor Alexander in 1810—an office which he held till 1813. In 1818, he was made commander-in-chief of the army of the west. His retreat to Smolensko, and the loss of the battle fought there on the 17th of Aug., raised the hatred of the Russian national party to a greater height than ever, and he was obliged to yield the chief command to Kutusow. It has been maintained by many, that B. de T. was the originator of the Russian system of defense in 1812. He had indeed advised a retreat to the interior, and recommended the avoidance of a battle; but the system of defense, as a whole, originated with gen. Pfuel, who had left the Prussian service, and constantly accompanied the emperor Alexander from the year 1807, without holding any distinct official appointment. At Moskwa, B. de T. commanded the right wing. After the death of Kutusow, he again obtained the chief command of the army, which he held at the battle of Bautzen, and retained till the truce. He afterwards commanded the Russian army in Bohemia, and took part in the battles of Dresden, Culm, and Leipsic. He was commander-in-chief of the Russian army in France, and in consequence of this was made a prince and a field-marshal. He died in 1818 at Insterburg, on his way to the Bohemian baths. Two or three years before his death, the estate of Tolly or Towie, in Aberdeenshire, the old inheritance of his family, was for sale, and he was pressed to buy it, but refused, on the ground that his family had been so long expatriated that Scotland was now to them a strange country.

BAR-COCH'BA, SIMON, the leader of the Jews in their great insurrection against the Romans, under the emperor Hadrian, from 131 to 135 A.D. Three times had the oppressed Jews revolted without success, from 115 to 118; and in 130, soon after Hadrian's return from Syria, a new rebellion broke out, for which they had been secretly preparing. At the head of it was one Simon, who assumed the name of Bar-cochba, i.e., "son of the star," pretending that the prophecy was to be fulfilled in him, "There shall come a star out of Jacob" (Numb. xxiv. 17). He fought at first with great success against the Romans, and even obliged them to evacuate Jerusalem, where he was proclaimed king, and caused coins to be struck with his name. The war spread over all the country of Palestine, and fifty towns, besides many villages and hamlets, came into the possession of the Jews. But on the arrival of Hadrian's general, Julius Severus, Jerusalem was retaken; and in August, 135, Bether, the very last strong fortress held by the Jews, was stormed by the Romans. B. fell on the day of this bloody conquest. During the war, hundreds of thousands of Jews were destroyed, many were executed, and very cruel edicts were subsequently issued against them. From this last struggle dates the final dispersion of the Jews over the face of the earth. The holy city was razed to the ground, and rebuilt under another name. The Jews still retain in their liturgy hymns which they chant in mournful memory of this tragic event. For a particular history of the struggle, see Münter's *Der Jüdische Krieg unter den Kaisern Trajan und Hadrian* (Altona, 1821).

BARD, the name known to the Romans since 200 B.C., by which the Gauls and other Celtic peoples (British, Welsh, Irish, and Scotch) designated their minstrels. Like the

Scôps of the Anglo-Saxons, and the Scalds of Scandinavia, the bards celebrated the deeds of gods and heroes at religious solemnities, and the festivities of princes and nobles, accompanying their recitations with the harp or chrotta (Ir. *cruit* and *clarseach*); they excited the armies to bravery, preceded them into the fight, and formed the heralds of princes, and the mediators of peace. The institution early disappeared among the Gauls, but lingered long in Wales, Ireland, and Scotland. The bards formed a hereditary order, and exercised a decided national influence. The minstrels among the Celts, as among the Germans, were the organ of the people, and the channel of all historical tradition. It is supposed that in Wales, about 940 A.D., their privileges were defined and fixed by the laws which bear the name of king Howel Dha; and in 1078 the whole order is said to have been reformed and regulated anew by Gryffith ap Conan. At Caerwys, Aberfraw, and Mathraval, there were held from time to time great competitions in minstrelsy, called eisteddfods, at which the judges were appointed by the prince. When Wales was conquered by Edward I. (1284), the bards lost their privileges, and were, according to tradition, persecuted and put to death; but succeeding princes countenanced the institution, and eisteddfods were repeatedly held under royal commission down to the reign of Elizabeth. Since then, exertions for the revival of national Welsh poetry and the bardic profession have been made by several societies: the Gwyneddigion, founded in 1770; the Cambrian, in 1818; and more recently, the Metropolitan Cambrian institution. To these societies, and to the patriotism of individuals, we owe collections of the relics of the lays of the Welsh bards, none of which, it should be added, can be traced to MSS. of an older date than the 12th century. The most interesting of those relics are those of Liwarc'h-Henn, Aneurin, and Taliesin. See Jones's *Relics of the Welsh Bards*, (1794); Owen's *Myvyrian Archæology of Wales* (3 vols., 1801–7); *Poèmes des Bardes Bretons du vi^e^ Siècle, par T. H. de la Villemarqué* (Paris, 1850), etc. See WELSH LANGUAGE AND LITERATURE.

In Ireland, the bards are believed to have been a hereditary guild, divided into three classes: the Filedha, who sung in the service of religion, and in war, and were the counselors and heralds of princes; the Braitheamhain, who recited or chanted the laws; the Seanachaidhe, who were chroniclers and genealogists to princes and nobles. Their ample privileges and endowments of land gave them an exorbitant influence, which both princes and people had sometimes to rise against and curb. The great skill of the Irish bards on the harp was acknowledged everywhere. After the conquest of Ireland by Henry II., the profession began to sink. Still many of the chiefs maintained bards in their families, whose songs and legends kept up the national feeling. This occasioned several measures of the English rulers against the Irish bards; Elizabeth ordered the bards that were captured to be hanged, as the instigators of rebellion. Turlogh O'Carolan, b. 1670, d. 1737, is reckoned the last Irish bard; his poems were translated into English by Furlory. Other lays of the bards have been translated by Miss Brook, *Relics of Irish Poetry* (Dub., 1789), and Hardiman, *Irish Minstrelsy* (Dub., 1831).

The bardism of Scotland may be conjectured to have been similar to that of Ireland; but nothing is certainly known of the subject beyond the fact that there were poets or bards, of different degrees, in the highlands down to the 17th century.

The name of B. was unknown among the Germanic nations; though a corrupt reading in some MSS. of the *Germania* of Tacitus (*barditus* for *baritus*, the "war-cry") led Klopstock and others to write wild religious and war songs, which they called "bardits," under the notion that they were restoring a branch of the national literature. This Ossianic aberration soon came to an end.

BARD, a fortress and village of Piedmont, situated on the left bank of the Doire, about 23 m. s. s.e. of Aosta. When the French crossed the St. Bernard in 1800, the fortress of B. offered a resistance to their further advance into Italy, which might have proved effectual had the Austrian garrison been sufficiently on the alert. The French failed to take the fortress by storm, but they succeeded in dragging their artillery under and past the guns of the fort during the night, and were far on the road to Ivrea before the Austrian commander was aware that they had passed. B. was taken a short time after by the French, and razed, but it has since been restored. Pop. about 550.

BARD, JOHN, 1716–99; b. Penn.; a physician, and first president of the medical society. He established the first quarantine on Bedloe's island, in New York harbor.

BARD, SAMUEL, LL.D., 1742–1821; b. Philadelphia; son of Dr. John; studied in Columbia college and the Edinburgh medical school; organized the medical school of Columbia college, and became dean of the faculty. While the federal government was in New York he was Washington's family physician. In 1813, he was president of the college of physicians and surgeons.

BARDESA'NES (properly Bar-Deisan), the founder of a Gnostic sect, was a native of Edessa, in Mesopotamia, and flourished towards the end of the 2d century. He stood high in favor with the monarch Abgar-bar-Maanu, but little is known regarding him. It is stated that he held a disputation with the philosopher Apollonius, who appeared in Edessa in 165 A.D., in the suite of L. Antonius Verus. He was first a disciple of Valentinus, whose heresy he afterwards abjured, and wrote against it, and also against other heresies; but ultimately he relapsed into partial agreement with his old master. His *Gnosis* was not purely dualistic. He did not consider evil the eternal coefficient of

good, but merely the result of a temporary reaction of matter on spirit. Yet, inexplicably enough, he maintained the devil to be a self-existent, independent being. He denied the doctrine of the resurrection of the body, and, in conformity with such a conviction, asserted that Christ's body was not real, but only an illusive image brought down from heaven. He diffused his opinions through the medium of hymns, of which he is reckoned the first writer in Syria. These hymns, fragments of which are still extant, exhibit a rich and pure fancy. His followers were called *Bardesanists*. They never formally separated themselves from the orthodox church, though they continued to exist as late as the 5th century. See Hahn's *B. Gnosticus Syrorum primus Hymnologus* (Leip., 1819).

BARDI, a small t. of Italy, on the left bank of the Ceno, 31 m. w.s.w. from Parma, in the province of Piacenza. The town is commanded by a castle, situated on a hill, erected in the 9th century. In the vicinity are noble forests of chestnut, beech, and oak. B. was formerly the capital of the duchy of Bardi.

BARDINGS, or BARD, such parts of horse-armor as protect the animal's head, neck, and rump; the "champfront," the "manifaire," the "poitrel," and the "croupier."

BARDOLI'NO, a t. of northern Italy, with a harbor on lake Garda, and about 14 m. w. from the fortress of Verona. The battle of Rivoli was fought in its vicinity in Jan., 1797.

BARDSTOWN, or BAIRDSTOWN, the seat of justice of Nelson co., Ky.; 40 m. s.e. of Louisville, on a branch of the Louisville and Nashville railroad; pop. '70, 1835. It is the seat of St. Joseph's (Roman Catholic) seminary and college, a college for women, an academy, and several important manufacturing establishments.

BAREBONES, or BARBONE, PRAISE GOD, a London tanner and fanatical member of the parliament of 1653, which became known by his name. After a short imprisonment at the restoration he was lost sight of.

BAREFOOTED (Lat. *discalceati*, i.e., shoeless), an appellation given to certain monks and nuns who abstain from wearing any covering on the feet, either entirely (as the Alcantarines, who originated at Placentia, in Spain, in 1540, but who are chiefly found at present in the kingdom of Naples), or for a specified period of the year (as the nuns of our Lady of Calvary); or who, instead of shoes, wear merely sandals, i.e., soles of wood, leather, rope, or straw fastened by thongs. They do not constitute a separate order in the Roman Catholic church, but are to be found as a higher grade of asceticism with more or less severity of observance, among most of the orders, Carmelites, Franciscans, Augustines, Eremites, Capuchins, etc. They are, however, steadily ignored by the more dignified Dominicans, though the latter are themselves mendicant friars. The origin of this form of religious austerity is to be traced generally to the custom which prevailed among the Jews and Romans of putting off their shoes on the occurrence of public calamities, that in this condition of mourning and humiliation they might implore the Divine Being for deliverance; but perhaps more particularly to the command which Christ gave his disciples (Matt. x. 10; Luke x. 4).

BARÈGES, a small watering-place in France, situated in the Pyrenees, about 18 m. from Bagnères de Bigorre. The mineral water for which it is celebrated contains principally sulphuret of sodium, with portions of carbonate, muriate, and sulphate of soda, nitrogen, and sulphureted hydrogen. Its efficacy in the cure of wounds, rheumatism, stiffness of joints, and scrofulous complaints is said to very remarkable. See Murray's *Hand-Book to France*.

BAREGES, mixed tissues adapted for women's dresses, called in France *crêpe de barèges*. The name is derived from the place noticed in the above article; in reality, however, B. were never made in that little watering-place, the seat of the manufacture being at Bagnères de Bigorre. B. are usually a mixture of silk and worsted; an inferior kind being composed of cotton and worsted. They vary in color, and are sometimes light in tint, with printed patterns. All are of a slight fabric for summer wear. The best are still manufactured in France.

BAREGINE. Many algæ are found growing in mineral springs, especially those of a sulphuric nature. The product of their growth is a mucus-like substance somewhat resembling the white or glair of an egg. This deposit is particularly abundant in the hot springs at Barèges, whence the name of baregine. It imparts a flesh-broth flavor and odor to the water, which is prized, and is sometimes imitated by adding animal gelatine to the sulphur baths where B. is deficient.

BAREILLY, the chief city of a district of the same name in Rohilcund, British India —a district which, with an area of 2982 sq. m., contains (1872) 1,507,139 inhabitants, and which is bounded on the e. by Oude and Nepaul. The city itself, with a pop. of 102,982 (1872), is in lat. 28° 23′ n., and long. 79° 28′ e., being 788 m. n.w. of Calcutta, and 152 m. e. of Delhi. It is pleasantly situated in a well-wooded country on the left bank of the Jooa, an affluent of the western Ramgunga. Besides a brisk and lucrative commerce, it has considerable manufactures, more particularly in the article of ornamental chairs and tables. It is the seat of a college attended by more than 300 students. B. became a name of notoriety in the great mutiny of 1857. On the 31st of May the city

was a scene of rapine and bloodshed. The native garrison, without any European troops to overawe them, rose against their officers and seized the public treasure. They murdered every European who had not the means of escaping. But fortunately, from a suspicion of the outbreak, the ladies and children of the company's servants, both civil and military, had previously been sent off in safety. B. was recovered by Sir Colin Campbell, afterwards lord Clyde, in May, 1858.

BARENTZ, WILLEM, one of the early explorers of the northern ocean; sailed from Holland in June, 1594, to find a n.e. route to China; explored a great part of Nova Zembla and returned. Next year he sailed with seven vessels laden with rich goods for eastern trade, but too late in the season to succeed. In May, 1596, he went as pilot of two ships sent out by the city of Amsterdam; at Spitzbergen the ships separated, and B. guided his own around Nova Zembla until frozen in at Ice Haven, Sept. 1, where they passed the winter in great misery, the sun being below the horizon 81 days. June 14, 1597, those who survived started in open boats for the mainland; B. died the second day; the others reached Lapland, where they found the other vessel, and were rescued. Interesting relics of B.'s expedition have recently been discovered.

BARE POLES. A ship with all her sails furled, either scudding before the wind or lying-to from stress of weather, is said to be "under bare poles."

BARÈRE DE VIEUZAC, BERTRAND, a member of the French national convention, b. at Tarbes, 10th Sept., 1755. He became an advocate in the court at Toulouse. After acting as a deputy in the national assembly, the department of the Hautes-Pyrénées elected him to the national convention in 1792. He is said to have been naturally in favor of moderate measures, but he was easily overawed by the influence of the party of the mountain, with whom he generally acted and whom he supported by his eloquence, which was so flowery and poetical in style that he came to be designated the Anacreon of the guillotine. He was president of the convention when the sentence was passed upon Louis XVI. He rejected the appeal to the people, and gave his vote with these words: "The law is for death, and I am here only as the organ of the law." His natural mildness, warring with the instinct of self-preservation, made him alternately a supporter of merciful measures and an advocate of the guillotine, and his whole public conduct betokens a man much more selfish than patriotic or humane. After the death of Robespierre, in which he had concurred, B. nevertheless proposed the continuation of the revolutionary tribunal, for which he was denounced by Lecointre and afterwards impeached and sentenced to transportation; his sentence, however, was not carried into effect, and he partook of the general amnesty of the 18th Brumaire. He was elected as a deputy to the chamber in 1815, during the hundred days. After the second restoration he was banished from France and went to Brussels, where he devoted himself to literary work till the revolution of July permitted his return. In the year 1832 he was once more elected as a deputy by the department of the Hautes-Pyrénées; his election, however, was annulled, on account of errors of form, whereupon the government called him to be a member of the administration of that department, which office he continued to hold till 1840. He died on 14th Jan., 1841. He bestowed upon the younger Carnot his *Mémoires*, which have been published (2 vols. Par. 1842). His many other political and historical writings are now of no importance.

BARETTI, JOSEPH, an Italian writer, b. at Turin, 1716. He was intended for the law, but devoted himself to literature. In 1751, he established himself as a teacher of Italian in London, where, in 1757, he published the *Italian Library*, giving an account of the most eminent Italian authors and their works. He was about this time appointed secretary for the foreign correspondence of the Royal Academy. In 1762, he published an account of his travels through Portugal, Spain, and the s. of France to Italy in *Lettere Famigliari*, which, with additions and a new title, were afterwards republished in England. B. now lived some time in Italy, and published at Venice a journal called the *Literary Scourge*, which brought upon him many prosecutions. On his return to England, he published, among other works, an Italian grammar, and an Italian and English dictionary, which have since gone through many editions. One evening, he became involved in a street-brawl in London, and stabbed with his penknife a man, who died soon after. B. was tried for murder, made his own defense, and was acquitted—Dr. Johnson, Burke, and Garrick testifying to the excellence of his character. He died in 1789 in London.

BARFLEUR, a seaport t. of France, in the department of La Manche, about 15 m. e. of Cherbourg. It is now a place of little importance, but it is noteworthy as being the port from whence, according to report, William the Conqueror set out on his invasion of England. In the 13th and 14th centuries, B. was twice pillaged by the English.

BARGA, or BARGA DE GARFAGNANA, a t. of Italy, in the province of Lucca, 25 m. n.n.e. from Pisa, near the left bank of the Serchio. B. has a fine collegiate church, and is celebrated for its gunpowder manufactories. The sides of the neighboring mountains are covered with noble chestnut forests.

BARGAIN AND SALE, in the law of England, is a mode of conveyance whereby property, real and personal, may be assigned or transferred for valuable consideration. It finds a chief place, however, in law-books in connection with the conveyance of *real*

estate. In regard to personal estate, *assignment* (q.v.) appears to be the more appropriate, as it is the more usual term. B. and S., then, may be described as a conveyance, in the way of a real contract, by means of which property in lands and tenements, whether that property be in possession, remainder, or reversion, is conveyed from one person to another. In its terms, it consists of a B. and S. by the seller to the intended vendee for money; and by the statute of frauds, 29 Chas. II., c. 3, it must be in *writing;* and by the statute of enrollments, the 27 Hen. VIII. c. 16, it cannot pass a freehold, unless it be by *indenture enrolled* within six months after its date, or with a *custos rotulorum* of the county. But hereditaments lying within any city or town corporate, the officers of which have authority to make enrollment of deeds, are excepted from this statute. A B. and S. for a term of years, however, will be effectual without enrollment. But see LEASE and RELEASE.

No particular form of words is essential to the validity of a B. and S.; "bargain and sell" are the words of transfer ordinarily used. But other words will have the same effect, and the distinctive character of the conveyance is determined by the consideration on which it is founded. This consideration, however, is held to be a mere matter of form, and sufficiently complied with if the conveyance purport to be so founded. To this end, any trivial sum may be inserted in the conveyance, though the consideration which really passes between the parties be of larger amount; or even though it be, in fact, not of a pecuniary nature. It is also immaterial whether the sum so inserted be actually paid or not.—Stephen's *Commentaries*, vol. i., pp. 535–537. See CUSTOS ROTULORUM, POSSESSION OF PROPERTY, REMAINDER, REVERSION, INDENTURE, LEASE, and RELEASE.

There is no such title to land or other real estate in the Scotch law, but in that system there may be a *bargain* as to land, the evidence of which must be in writing, the Scotch law in this respect agreeing with the regulations of the English statute of frauds above referred to. The term bargain is also used by Scotch lawyers to signify a contract or agreement for the sale of personal or movable property, and to such a bargain the intervention of writing is not necessary, but it may be proved by witnesses.

BARGA PASS, in the Himalaya, in n. lat. 31° 16′, e. long. 78° 19′, the highest part of it about 15,000 ft. above the sea.

BARGE, an ancient t. of Piedmont, in the province of Cuneo, 30 m. s.w. of Turin. Pop. '71, 2429, who are engaged in the manufacture of fire-arms and the quarrying of slate. A brisk general trade is also carried on.

BARGE. Various forms of vessel receive this appellation. The admiralty and city of London barges, used on ceremonial occasions, are elegantly fitted out, and supplied with accommodation for many rowers. The B. belonging to a man-of-war, for the occasional use of the superior officers, is a well trimmed, though not showy boat, light enough to be easily hoisted in and out of the ship. On our rivers and canals, a B. is a clumsy, flat-bottomed vessel of burden, employed either in conveying goods from one town or quay to another, and to aid in bringing stores to and from ships. There are several kinds of this last-named craft—namely, coal-barges, sand-barges, west-country barges, etc. For the chief points of difference between barges and other boats, see BOAT.

BARGE-BOARD. Where the roof, in Gothic houses, extends over the wall, the gable is generally furnished with a board, which either covers the rafter, or occupies the place of a rafter itself. These B.-B. were often very richly ornamented, particularly in the 14th and 15th centuries. The accompanying illustration is copied from *Parker's Glossary of Architecture.*

BARHAM, RICHARD HARRIS, 1768–1845; an English humorist known as "Thomas Ingoldsby." He began to study law, left it for the church, and was ordained in 1813. In 1821, he was appointed minor canon of St. Paul's, London, and three years later became one of the priests in ordinary of his majesty's chapel royal. In 1837, he began in *Bentley's Magazine* the grotesque *Ingoldsby Legends*, which gave him immediate and enduring fame as a humorous writer, one with scarcely a rival since Butler wrote *Hudibras.* Yet his life was grave and dignified, and he was held in high honor. Though a tory in politics, he was the life-long friend of Sydney Smith, the prominent liberal; and Theodore Hook was also among his friends. He published one novel, *My Cousin Nicholas*, and contributed largely to the *Edinburgh Review* and the *Literary Gazette*, besides furnishing a third of the articles for a large biographical dictionary. "His sound judgment and kind heart made him the trusted counselor, the valued friend, and the frequent peace maker; and he was intolerant of all that was mean, base, and false."

BARI (ancient *Barium*), a city in the kingdom of Italy, capital of a province of the same name, is situated on a peninsula in the Adriatic, in lat. 41° 8′ n., and long. 16° 53′ e., and about 140 m. n.n.e. from Naples. Pop. '72, 50,524. It is strongly fortified, and defended by a massive old castle of Norman origin, nearly a mile in circumference. The city is divided into the old town and the new. The streets, with some few exceptions, are confined and gloomy. B., which is the see of an archbishop, has manufactories of cotton, silk, linen, soap, etc., and carries on an active export trade in oil, corn,

and fruit with Trieste and Dalmatia. Its harbor does not admit of the entrance of large vessels; but its quay and roadstead are good. It has some fine ecclesiastical structures, the most notable of which is the priory of St. Nicholas, a noble specimen of the Lombard style of architecture, founded in 1087, and liberally endowed by the brothers Guiscard. Within the walls of this building, Urban II., in 1098, held a council of Greek and Latin bishops, with the view of settling the differences between the two churches; and Roger II. was here crowned king of Sicily. The priory contains some interesting monuments and relics, the most remarkable of which is the tomb of Bona Sforza, queen of Poland, who died in the castle in 1557. B. is one of the cities believed to have been founded by Iapyx, son of Dædalus. Its coins show it to have been a place of considerable note among the Greeks as early as the 3d c. B.C. The Romans appear to have held it in but little repute; but it rose in esteem when, in the 10th c., it fell into the hands of the Greek emperors, who made it the capital of Apulia, and the residence of a viceroy. It was twice taken in the 11th c. by the Normans, who added to its strength and importance.—The province of B. contains 2280 sq.m., and a pop. of (1872) 604,540.

BA'RI, or BARIS, a savage negro tribe on the White Nile, living under chiefs. They are polygamists, and generally at war with traders, or among themselves. The poorer classes are employed in manual labor.

BA'RI, TERRA DI, a province in Italy, on the Adriatic, n. of Otranto; 2406 sq.m.; pop. '71, 604,540. The surface is mostly level, soil calcareous, covered with loam; the summers very hot, but other seasons pleasant. The Ofanto is the only river of any size. The province is well cultivated, producing grain, tobacco, flax, cotton, wine, oil, almonds, etc. Fine-wooled sheep are numerous, and salt and niter works are important. Besides the capital of the same name, the chief towns are Barletta, Trani, Bisceglie, Molfetta, Monopoli, and Tasano, on the coast, and Andria, Ruvo, Nola, Bitonto, and Conversano, inland.

BARIGAZ'ZO, a village of the province of Modena, remarkable for the streams of fire several feet high which issue out of the soil in the vicinity, and continue to burn for days without intermission.

BARIL'LA, an impure carbonate of soda, procured from plants which grow in salt-marshes or other places near the sea, and which forms a considerable article of commerce, being used in the manufacture of soap and of glass, and for other purposes in the arts. The greatest quantities of B. are produced in Spain and the Balearic islands; but the Canary islands, Italy, and France, also contribute a part. It is procured by burning the plants, much in the same way that sea-weeds are burned upon the coasts of Scotland to procure kelp. The Spanish B. is most esteemed, especially that produced near Alicante, which is chiefly obtained from the *salsola sativa*, a plant of the natural order *chenopodiaceæ*. This plant is there cultivated in grounds close by the sea, embanked on the side nearest it, and furnished with floodgates, through which the salt water is occasionally admitted. It is cut in Sept., dried in small heaps, and then burned in a hole in the ground. Other species of *salsola* (salt-wort), as *S. tragus* and *S. kali* (the latter a common native of the shores of Britain), are also burned for B., although they yield it in smaller quantity than *S. sativa*. B. is made in France from *salicornia herbacea* or *annua* (glass-wort), another of the *chenopodiaceæ*, plentiful also in salt-marshes on the shores of Britain and other parts of Europe. The manufacture of B. has greatly declined, from the fact that soda can now be made artificially from common salt. See SALT-WORT.

BARI'NAS, or VARINAS, a state in s. central Venezuela; 17,494 sq.m.; pop. 210,000; a fertile region producing coffee, indigo, tobacco, and tropical fruits in abundance, besides immense herds of cattle, sheep, asses, and mules. Barinas, the city of the same name, is on the Santo Domingo, 262 m. s.w. of Caraccas; pop. 3950. It was once prosperous, but was sacked by royalists during the war of independence. Tobacco of excellent quality is its chief export. The streets are regular, and the houses neat and clean.

BARING. The firm of Baring Brothers is one of the greatest commercial houses in the world. Its founder was John B., a German, who settled in a small business in Exeter, England, in the first half of the 18th century. Two of his sons, Francis and John, established in London in 1770 the now existing house.

FRANCIS became a director of the East India company, and being a stanch supporter of Pitt, was created a baronet by that minister in 1793. He took an active part in the discussions relative to the bank restriction act of 1797.

Sir THOMAS B., eldest son of the above, b. June 12, 1772, succeeded his father in the baronetcy. He appears to have taken no active part in the business of the firm, being chiefly remarkable as an admirer and encourager of art. His magnificent collection of paintings was dispersed by public sale after his death in April, 1848.

ALEXANDER B., brother of the above. See LORD ASHBURTON.

Sir FRANCIS THORNHILL B., son of sir Thomas, whom he succeeded, was b. in 1790, was educated at Oxford, where in 1817 he took a double first class. He entered parliament as M.P. for Portsmouth in 1826. Under successive whig governments, he was a lord of the treasury, secretary to the treasury, chancellor of the exchequer, and first lord

of the admiralty. He was more noted for his business aptitude than as a politician. He was created baron Northbrook in 1866, and died the same year. His son, the present lord Northbrook, was governor-general of India from 1872 to 1876.

THOMAS B., brother of the first lord Northbrook, b. in 1800, devoted himself early to commercial pursuits, and also to politics, taking the opposite side to his brother. He was, however, much more widely known as a partner in the firm of B. Brothers than as a politician. He died in Nov., 1873.

The firm is engaged to a large extent in the negotiation of national loans, in exchange and money-broking, in the produce trade, home and colonial, and in importation and exportation from and to foreign countries.

BARING, CHARLES, b. 1807; son of sir Thomas; a graduate of Oxford; bishop of Gloucester and Bristol in 1856; in 1861, the successor of Montague Villiers in the see of Durham.

BARING, THOMAS GEORGE, b. 1826; the second lord Northbrook. He has been a lord of the admiralty, under-secretary for war, member of parliament, and in 1872 was appointed viceroy and governor-general of India.

BARING-GOULD, SABINE, b. 1834; an English author educated at Cambridge; in 1863 he published *Iceland, its Scenes and Sagas*. He subsequently took orders, and was curate in several places. Among his works are *Post-Mediæval Preachers, The Book of Were-Wolves, Curious Myths of the Middle Ages, Origin and Development of Religious Belief, The Golden Gate, Legends of Patriarchs and Prophets*, etc.

BARI'TAH, *Bari'ta*, a genus of large Australian birds, placed by some ornithologists in the family of shrikes (q.v.), (*laniadæ*), and by others in that of crows (q.v.), (*corvidæ*). The bill is large, conical, scarcely curved, the base of it extending remarkably backward on the forehead. The best known species is the piping crow, or piping grakle, or Jarra-warnang of New South Wales (*C. tipicen*). It preys on small birds, is gregarious, has a melodious voice, is easily tamed, soon learns to whistle tunes, and exhibits a great power of mimicking the voices of other birds.

BARIUM (sym. Ba, eq. 68.5, in new system 137) is the metal present in heavy spar (sulphate of baryta) and baryta. It was regarded as a white metal, until the researches of Dr. Matthiesen demonstrated that it possesses a yellow color. As yet, the metal B. has not been obtained in mass, but only as a powder. It decomposes water readily at ordinary temperatures, and exposed to the air, quickly combines with oxygen, forming the *oxide of B.* (BaO), or BARYTA. The latter substance is an earth resembling ordinary caustic lime, and may otherwise be prepared by adding finely divided black oxide of copper (CuO) to a solution of sulphuret of B. (BaS), when the sulphuret of copper (CuS) is thrown down, and the baryta (BaO) is left in solution. On evaporation the water of solution passes off as steam, and leaves the solid earthy-looking substance, baryta. A third mode of preparing baryta is to heat strongly the nitrate of baryta ($BaONO_5$), when the nitric acid (NO_5) flies off, and leaves the baryta (BaO). The *sulphuret of B.* (BaS) is obtained when the sulphate of baryta ($BaOSO_3$) in powder is mixed with finely-pulverized coal, and the whole being placed in a crucible, is raised to a red heat in a furnace. The result is, that 4 atoms of the carbon (C) of the coal carry off the 4 atoms of oxygen in the sulphate of baryta as carbonic oxide (CO), whilst the B. united solely with sulphur is left behind as the sulphuret of B. (BaS). The *chloride of B.* is prepared by adding hydrochloric acid (HCl) to a solution of the sulphuret of B. (BaS), when hydrosulphuric acid (HS) escapes, and chloride of B. remains behind, and on evaporation of the liquid, is obtained in crystals.

BARK. See BARQUE.

BARK (*cortex*), in phanerogamous or flowering plants, is the external covering of the stem. It is composed of layers of cellular tissue, whilst the woody stem, to which it forms a sort of sheath, is vascular. In endogenous plants (palms, etc.), there is not, in general, a very marked line of separation between the B. and the vessels or vascular bundles of the stem, so that these plants are generally, but incorrectly, said to have no bark. It is in exogenous plants, and especially in perennial woody stems, that the development of B. is most perfect, and the distinction between wood and B. most marked. The outermost layer of the B. of exogenous plants is the *epidermis* (q.v.), which, however, is in general only to be seen in annual stems, and in the youngest parts of woody stems; peeling off as the stem becomes older along with the outer layers of the true bark. Beneath the epidermis is the true B., of which the outer layer is called the *epiphlœum* (Gr. outer bark), and consists of cells, usually rectangular and flattened, with thick walls. The inner layer of the true B. is called the *mesophlœum* (Gr. middle bark), and is generally formed of a cellular tissue of roundish cells with thin walls. These layers are sometimes very distinctly separated from one another, and sometimes pass gradually into one another; sometimes there is merely a continuous cellular tissue. Within the true B. is a very distinct layer, the inner B., *liber* (Lat.) or *endophlœum* (Gr. inner bark), also frequently called bast, which is composed of bundles of woody fiber or vascular tissue mixed with cellular tissue. The layer of cambium (q.v.) is often regarded as belonging to the inner B., but rather belongs to the vascular part of the stem. In the inner B. are sometimes found cells containing a milky juice, as in the *apocynaceæ*, or

vessels for a milky juice, as in the common fig. The combined strength and flexibility of the fibers of the inner B. render it in many cases useful for various purposes. See FIBER and BAST. In the true B., the peculiar juices and most characteristic substances elaborated by the plant are very generally found, for which reason that part is often of the greatest importance in medicine and the arts. The B. of many trees abounds in *tannin* or *tannic acid* (q.v.).

The B. of a stem or branch of not more than one year old exhibits only a cellular integument or epidermis with an interior lining of woody fiber—the inner B.; but new layers are added from year to year, the B. as well as the woody stem being increased from the cambium, the mucilaginous layer which is interposed between them, and which particularly abounds in spring, when the separation of the B. from the stem is most easy. The annual layers, however, cannot long be distinctly recognized in the B. as in the wood; and in the older portions of woody stems, the outermost parts of the B. become desiccated and lifeless, and are in general gradually thrown off. On this account, those mosses, lichens, and other plants which attach themselves only to the outermost layer of the B. of trees, and derive their nourishment from it, cannot be regarded as true parasites, as they are in no degree supported by the juices of the stem, but only consume and remove external matter already destitute of life. The B. of some trees is remarkable for the thickness which it acquires, as that of the cork-tree, in which the *epiphloeum* is formed of many layers of cells. The outer parts of thick barks very often crack, to admit of the expansion of the stem within; in the lace-bark tree of the West Indies, the fibers of the inner B. become partially separated as it is distended, forming lozenge-shaped meshes arranged with beautiful regularity.

The connection between the cellular tissue of the B. and that of the pith in the center of the tree is continually maintained by means, in exogenous stems, of the medullary rays. See EXOGENOUS PLANTS and PITH. The B. is a protection to the young and tender wood; it appears also to exercise functions analogous to those of the leaves, which, when young, it resembles in its color, and which are regarded as dilatations of it, so that it has been called the "universal leaf" of a plant.

BARK, in medicine, etc. The principal barks used in medicine will be found noticed in separate articles. See ANDIRA (*Cabbage B., Surinam B.*); ANGOSTURA B.; CARIBBEE B. (*Jamaica B., St. Lucia B., Piton B.*); CASCARILLA (*Cascarilla B., Eleutheria B.*); CINCHONA (*Cinchona B., Peruvian B., Jesuits' B.*, China, Cascarilla, *Arica B., Calasaya B., Carabaya B., Huamalies B., Huanuco B., Jaen B., Loxa B., Maracaibo B., Ash B., Crown B., Silver B., Yellow B., Tan B.*, etc.); CLOVE B.; COPALCHE B.; CULILAWAN B.; WINTER'S BARK.—When B. is mentioned without any prefix, it is always cinchona, otherwise called Peruvian or Jesuits' B., which is intended.

The barks used for dyeing, tanning, and other purposes in the arts, being generally named from the trees which produce them, particular references here are unnecessary.

BARK, FOR TANNING. The B. of many trees is capable of being used for tanning (q.v.), but those kinds of B. are preferred which particularly abound in tannic acid. Oak B. is principally used in Britain and throughout Europe; also in North America, although that of America is obtained from species of oak different from the European; in Spain, the inner layer of the B. of the cork oak, or cork-tree, is employed, and it is to some extent imported into Britain for the use of tanners. The B. of the chestnut is also much esteemed. Larch B. and willow B. are used in preparing some kinds of leather. The B. of the birch and that of the alder are also employed; birch B. being, however, more esteemed for steeping fishermen's nets and cordage, to preserve them from rotting, than for the preparation of leather. Different species of *acacia* (q.v.) and of *eucalyptus* (q.v.) furnish barks used for tanning in Australia, some of which have, to a small extent, become articles of commerce.

The *barking* of trees can be accomplished with facility only in spring, when the sap has begun to circulate. The tree being felled, the rough external lifeless parts of the B. are removed as useless, by means of a sharp instrument called a *scraper;* the smaller branches are cut into lengths of about 2 ft., and their B. is loosened by beating with a mallet, and easily taken off—as boys at the same season make plane-tree whistles; the B. of the trunk and main branches is cut through by a chisel-like instrument, called a *barking-iron*, into similar lengths, each of which is divided longitudinally, and finally stripped off by the aid of mallets, chisels, etc. The B. is sometimes dried in sheds, being placed on narrow shelves or frames in such a way that there may be a very free circulation of air about it; sometimes in the open air, when it is very generally made to rest in a sloping position against trunks of trees placed horizontally at a little distance from the ground, the larger pieces of B. being placed so as to protect the smaller both from sun and rain. Great care is necessary in the drying of B., as it is much spoiled if allowed to get moldy, and is liable to suffer injury from rain or from the exposure of its inner surface to the sun.—Oak and birch B. are usually about equal in their price, which, however, varies very much, from £4 to £8 per ton. Larch B. is much less valuable; it is also of much greater bulk in proportion to its weight. The B. is a very important source of the revenue derived from many woods and coppices.

BARK BEETLE, or BARK-CHAFER, a name common to many of the large family of coleopterous insects (q.v.), called by entomologists *xylophagi* (Gr. wood-eaters). They

are all small, and generally of uniform color; they have hard bodies, and short, often club-shaped antennæ. Most of the family live in wood or other vegetable substances, as mushrooms, dried plants in herbariums, etc., and some of them are extremely injurious to living trees. Those called B. beetles or bark-chafers bore holes in the bark, and deposit their eggs in the inner bark, in which the larvæ excavate pathways, often causing the death of the tree. One species in particular, sometimes called the common bark-chafer (*tomicus typographus*), and sometimes the typographer beetle, from the figure of its burrows, has from time to time appeared in extraordinary numbers, ravaging the forests of Germany. In 1783, it caused the death of a million and a half of pines in the Harz forest alone. This insect is mentioned in some of the old German liturgies under the popular name of "the Turk," which its dreaded ravages obtained for it.

BAR'KAL, or JE'BEL BAR'KAL, a singular sandstone rock in Nubia, situated in lat. 18° 31′ n., and long. 31° 46′ e., about a mile from the right bank of the Nile. It is quite isolated, perpendicular on the side facing the river, and very steep on all. It is about 2 m. in circumference at the base, and 400 ft. in height, its summit forming a pretty broad plateau. Between it and the river are the remains of some magnificent temples, the two principal ones being known as the typhonium, and the great temple, one of the largest monumental ruins of Nubia. The ancient city of Napata is supposed to have been situated in the vicinity. The two red granite lions, now in the Egyptian room of the British museum, were brought from here in 1832 by lord Prudhoe.

BARKER, EDMUND HENRY, a well-known English philologist, was b. 22d Dec., 1788, at Hollym, in Yorkshire, and studied at Cambridge. Besides editions of several Latin classics, and numerous contributions to periodicals, particularly to the *Classical Journal*, he was led, during a residence with the famous philologist Parr, to undertake a revision of Stephens's *Thesaurus Linguæ Græcæ*. This gigantic work was violently assailed in the *Quarterly Review* by Blomfield, against whom B. wrote his *Aristarchus Anti-Blomfieldianus* (London, 1818); yet he and his publisher, Valpy of London, carried it on and completed it in a spirited manner (13 vols., 1816–28). In 1812 appeared the first volume of his *Classical Recreations*. He also supplied materials for the composition of Sturtz's *Etymologicum Gudianum*. He likewise translated some works of German philologists, among others, Buttmann's *Greek Grammar for Schools*. He collected the mass of anecdote and criticism relative to his friend Dr. Parr, which was published in 2 vols. in 1828–29, under the title of *Parriana*, a work well-nigh unreadable, from the superabundance and ill-digested nature of its matter. He also assisted prof. Dunbar in the compilation of the Greek and English Lexicon published in 1831. He lost all that he had in a lawsuit about a valuable inheritance, so that he was obliged to sell his fine library, and was put into the debtors' prison. He died in London, Mar. 21, 1839, in extreme poverty.

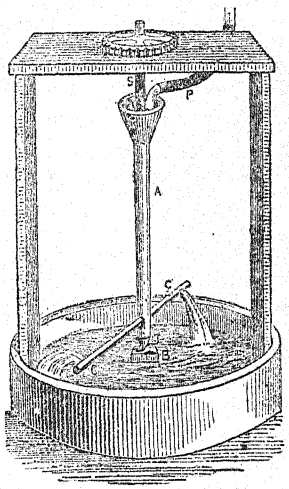
BARKER, FORDYCE, b. Maine, 1819; graduated at Bowdoin, and studied medicine at Harvard, Paris, and Edinburgh; professor of midwifery at Bowdoin, and in New York medical college; president of the New York state medical society, and professor of clinical midwifery and diseases of women in Bellevue medical college. He wrote, in 1872, a treatise on puerperal diseases.

BARKER, GEORGE F., b. Mass., 1835; graduate of Yale scientific school; chemical assistant in Harvard medical school; professor of chemistry and geology in Wheaton (Ill.) college; acting professor of chemistry in Albany medical college; professor of physiological chemistry and toxicology in Yale; professor of chemistry in the university of Pennsylvania, and vice-president of the American association for the advancement of science. He has lectured in many cities, and is author of a *Text-Book of Elementary Chemistry*.

BARKER, JACOB, 1779–1871; b. Maine; an eminent merchant and financier. He began trade in New York; lost his fortune in 1801; recovered soon after, and in the war of 1812 raised a loan of $5,000,000 for the government. He was a state senator in New York when the senate was the court of appeals. He established a newspaper to advocate the election of De Witt Clinton for governor; founded the exchange bank in New York, and became a heavy operator in stocks; failed, was indicted with others for conspiracy to defraud; defended himself in person, and the jury disagreed; was tried twice more, and then the indictment was quashed. He removed to New Orleans in 1834 and built up a fortune, but was impoverished by the rebellion, in which he was loyal to the union.

BARKER, JOHN, descended of an English mercantile family, became, in 1799, agent for the East India company at Aleppo; in 1826, British consul at Alexandria; and afterwards consul-general in Egypt. In the year 1834, he removed from this situation to the lonely but lovely valley of Suedia on the Orontes, four leagues from Antioch, where he employed himself in the cultivation of the choicest fruits of Asia and Europe. We are indebted to him for the Hanwick nectarine, the most delicious yet introduced into our gardens. The good terms on which he stood with the people around him and with the government, enabled him to render many valuable services to European travelers. He died at Suedia on the 5th of Oct., 1850.

BARKER'S MILL (Fr. *roue à réaction*, Ger. *Segner's wasserrad*), a water-wheel invented by Dr. Barker towards the end of the 17th century. It is represented in its simplest or typical form in cut. A is a wide metal pipe, resting at its lower end by the steel spindle T, on a metal block B, and kept in a vertical position by the spindle S, at its upper end, which passes through the frame of the machine, so that it can easily revolve round its axis. Near its lower end, two smaller pipes or arms, C, C, are inserted, which project horizontally from it, and these have each, at the outer extremity, a hole cut vertically in them, opening towards opposite sides. The water is supplied by the pipe P, which opens over a funnel-like widening on the upper part of A, and the quantity is so regulated that while the pipe A is kept nearly full, no more is admitted than issues from the lower orifices. The reaction caused by the water gushing from the arms, forces them backwards, and gives to the whole machine a rotatory motion. This reaction is much the same as is seen in the recoil of a gun when fired, or in the pushing back of a small boat by the foot on stepping ashore. It may be also thus explained: Suppose that the arms were closed all round, the water would press against the sides with a force proportional to the height of the water in the pipe A, and the pressure against any particular surface of the side would produce no motion of the arm, because an equal pressure is exerted in a contrary direction by a corresponding surface opposite to it. Now, if one of these surfaces be cut out, the pressure against the other being uncounteracted, forces the arm in the opposite direction to that of the side in which the whole is made. This being done to both arms on opposite sides, two equal pressures are produced, which conspire in generating the same motion of rotation. As soon as motion ensues, centrifugal force comes into play, which, throwing the water out towards the ends of the arms, increases the rapidity of its discharge, and also its reacting power. When the wheel is in action, the water thus acts under the influence of two forces—one being the pressure of the column in A, and the other the centrifugal force generated by the rotation of the wheel itself. The motion of the wheel is transmitted by the spur-wheel fixed to the spindle S, to the machinery which is to be driven by it, or, in the case of a corn-mill, the spindle passes directly through the lower millstone, and is firmly fixed into the upper one.



The power is manifestly increased by heightening the water-column, or by lengthening the arms—the former increasing the pressure of the water, and the latter increasing the leverage at which this pressure acts. In the mill shown in the figure, the column in A cannot be advantageously heightened, for the higher it rises, the greater must be the weight which the conical spindle, T, has to sustain, and the greater, consequently, becomes the friction. It is from this circumstance that such mills are found, in practice, to yield but a small mechanical effect—the friction consuming too large a proportion of the work of the wheel. Hence, in the reaction wheels now in use, the original B. M. has been so modified as to allow of the water being conducted from the reservoir below the arms instead of above. This is effected by making the vertical pipe revolve below in a stuffing-box at its junction with the conduit, and above, by a pivot moving in the fixed frame. By this arrangement, the friction attending the rotation is reduced to a minimum, for not only is the weight of the water placed out of account, but also a large proportion of the weight of the wheel itself, which is borne by the upward pressure of the water. The mechanical performance of such wheels is said to be highly satisfactory, producing, with a limited supply of water falling from a considerable height, a useful effect, hardly to be obtained by any other contrivance. The power of these machines may be also increased by using curved instead of straight arms. With straight arms a considerable loss of force is incurred by the sudden change of the direction of the current when it leaves the arm, which does not take place to the same extent with curved arms, where this change is effected gradually. In Whitelaw's mill (hence called the Scottish turbine), the form of B. M. generally met with in Scotland, there are three instead of two curved arms of this description. Considerable difference of opinion still exists as to the merits of B. M., some considering it as the most perfect way of applying water-power, and others putting it in the same rank as an undershot wheel, with the same water-supply. Of late years, it has been more extensively employed than formerly, both in this country and on the continent. See WATER-POWER.

BARKING, a t. of the co. of Essex, England, in a low flat situation, on the left bank of the Roding, about 2 m. above its junction with the Thames, and 5 m. n.e. of London, on the North Woolwich railway. Pop. '71, 5766, among whom are many fishermen, who pursue their occupation on the Thames, the tide flowing up the Roding to the town. The mouth of the Roding is often called Barking creek. The neighborhood

sends large quantities of potatoes and vegetables to the London market. There is also a transit trade in coal and timber. The church of St. Margaret is an edifice of considerable beauty, in the perpendicular style, and probably of the beginning of the 15th c.; but it contains three columns of the early Norman style, supposed to have been brought from the ruins of the adjacent abbey.—*Barking Abbey* was one of the richest nunneries in England. It was founded about 677 A.D., in the reigns of Sebba and Sighere, kings of the East Saxons, by St. Erkenwald, bishop of London, whose sister, St. Ethelburga, was the first abbess. In 870, it was burned to the ground by the Danes, and the nuns killed or dispersed. It was rebuilt and restored to its former splendor by king Edgar, in the middle of the 10th century. The abbess of Barking was one of four ladies who held the rank of baroness in right of their office. She lived in great state, and always furnished a quota of men to the king in time of war. She was required also to maintain certain embankments on the Thames. Several queens of England, and other ladies of very high birth, assumed the office of abbess of Barking. After the suppression of convents by Henry VIII., the abbey buildings soon went to ruin, and scarcely any remains exist except the gate-house.

BARK-STOVE, in gardening, a kind of hot-house intended for those plants which require not only the greatest heat, but also a continually moist atmosphere. It derives its name from the use of tanners' bark, for the purpose of producing this atmospheric condition. The bark is placed in a pit, lined and paved with brick, and pots containing tropical plants are sunk in it; by which means the plants not only enjoy a moisture resembling that of their native climates, but the earth around their roots is kept uniformly and moderately heated. The principle of the B. is adopted in pineries, palm-houses, etc., also in forcing-stoves for producing the ordinary fruits and vegetables of temperate climates at unusual seasons. A considerable heat results from the fermentation of tanners' bark, but it is not upon this that its value in the B. chiefly depends.

BAR'LAAM AND JOS'APHAT, one of the most widely-spread religious romances of the middle ages, relating the conversion of the Indian prince Josaphat by the hermit Barlaam, and thereby illustrating the power of Christianity to overcome temptation, and proving its superiority over all other creeds. The story, however, has been discovered to be nothing more or less than a Christianized version of the legendary history of Buddha, agreeing with it in all essentials and many details. The celebrated divine, John Damascene, is regarded as the author of the original Greek MS., which was first published by M. de Boissonade in the 4th volume of his *Anecdota* (Paris, 1832), and translated into German by Liebrecht (Münst., 1847). But even in the middle ages, a Latin version of this romance had been extensively circulated. About the end of the 15th c., it was often printed in a detached form, and later it appeared amongst the works of John Damascene (Paris, 1609). Vincent de Beauvais wove the story into his *Speculum Historiale*. From the Latin version sprung three French poetical versions belonging to the 13th c., and as yet unprinted. The Italian *Storia di S. Barlaam* (latest edition, Rome, 1816) may be traced to a Provençal original as early as the beginning of the 14th century. In Germany, Rudolf von Ems derived his poem, *B. and J.*, first printed at Königsberg (1818), and later at Leipsic, from the Latin of John Damascene. There is also an Augsburg impression of a prose translation of the ancient Latin text, belonging to the close of the 15th century. The Spanish *Historia de B. y J.*, by Juan de Arze Solorzano (Madrid, 1608), the Polish poetical version, by Kulizowsky (Cracow, 1688), as well as the Bohemian (Prague, 1593), are all borrowed from the Latin; while the Icelandic *Barlaams Saga*, and the Swedish popular tale, *B. och J.*, have a German source. A Norwegian version, printed from an old vellum MS. of the beginning of the 13th c., said to have been translanted by king Hakon Sverreson, appeared in 1851. This romance has even been rendered into the Tagala language of the Philippines, and there printed (Manilla, 1712).

BAR-LE-DUC, or BAR-SUR-ORNAIN, a t. in the department of the Meuse, France. It is situated on the Ornain, about 125 m. e. from Paris, with which it is connected by railway, and with the Rhine by canal. Pop. '76, 16,643, who manufacture cotton and calicoes, and carry on a considerable trade in timber from the Vosges, for the use of Paris, and in iron, wool, and wine. B. has a communal college, normal school, and public library. Its origin dates from the 10th century.

BARLET'TA, a fortified seaport of Italy, province of Bari, on the Adriatic. Pop. '72, 28,163, who carry on a large shipping-trade with Greece, the Ionian islands, and other ports of the Adriatic. The town is well built, handsome, and clean; has a fine cathedral, a colossal statue supposed to represent the emperor Heraclius, a college, theater, and castle, formerly one of the most impregnable fortresses in Italy. A feature of B. is the large and magnificent gateway which leads to its harbor. During the blockade of B. by the French in 1502–3, which ended in the defeat and death of their commander, the duke of Nemours, the celebrated combat between eleven cavaliers of France, and as many of Spain, in which the chevalier Bayard so distinguished himself, took place, and ended in a drawn battle.

BARLETTA, GABRIELLO, an Italian Benedictine preacher of the 18th c., famous for eccentricity as well as eloquence, interlarding the reading of litanies with sharp practical comments. His collected sermons passed through many editions.

BARLEY, *Hordeum*, a genus of grasses, to which belong one of the most extensively cultivated kinds of grain. The genus is distinguished by spiked inflorescence, three spikelets being always situated upon each tooth of the rachis, of which sometimes only the middle one is fertile, and sometimes all the three, so that in the former case the fruit-bearing spike is two-rowed, and in the latter case, six-rowed; the glumes are two, containing a single floret; the paleæ two, the outer one awned; and the seed is surrounded by the paleæ. The species of this genus are almost all annual, although some varieties of B. are sown in the end of autumn, and the cultivation of them extends over the winter. B. is mentioned in the books of Moses and other books of the Old Testament, also by the Greek and Roman writers, and has been extensively cultivated from remote antiquity. Beer made from it was known to the Greeks, the Egyptians, and the ancient Germans. The cultivation of it appears to have extended from Italy northwards in Europe, but it is better adapted than any other grain to the most northern regions, some of its varieties being cultivated with advantage where the climate is too cold, or the summer too short, for any other cereal crop; and it is deemed probable that its native country is northern or central Asia. It is capable, however, of being cultivated in very warm climates, and extends over a wider climatic range than any of the other grains. B.-meal is used for bread in the northern parts of Europe, but in other parts of the world, B. is more generally converted into malt for the making of beer (see BREWING), or merely deprived of its outer skin, and so used as an article of food. B. intended for brewing is first subjected to the process of *malting*, by which it is converted into MALT (q.v.). B. simply deprived of the husk (*palea*) in a mill is called *pot B.* or *Scotch B.* When the pellicle of the seed is also removed, and the seed itself rounded and polished, it is *pearl B.* What is sometimes called *patent B.*, is a farina obtained by grinding pearl B., and differs from B.-meal in being quite free from a degree of acridity which the latter derives from the integuments of the seed.

It is doubtful if this grain is produced by more than one species, or whether what have been described as distinct species by botanists, are not really mere varieties, the result of long cultivation. *H. vulgare* is usually distinguished as having the grains disposed in four rows; *H. hexastichon*, as having them in six rows; and *H. distichon*, as having the lateral spikelets abortive, and the grains, therefore, in two rows. But the lower part of the spike in the varieties ranked under *B. vulgare* is often six-rowed, and only the upper part four-rowed, and in rich soils, a tendency to resume the six-rowed form is otherwise manifest. Nor are the kinds known as *naked B.*, in which the seed separates readily from the paleæ, to be looked upon as more distinct. The four-rowed or six-rowed varieties are generally coarser, but more productive than the two-rowed; and some of them, often called BEAR or BIGG, are regarded as most suitable for exposed situations and inferior soils. A kind with naked seeds, called *Siberian B.* (*H. cœleste* of some writers), is extensively cultivated in some parts of Europe, and its straw is regarded as affording a richer food for cattle than that of most other kinds. The *Nepaul* or *Himalaya* B., another variety with naked seeds, and further characterized by the irregular manner in which the grains are placed in the spike, paleæ three-lobed at the end, and very short awns—and which is therefore regarded by some botanists as a distinct species (*H. trifurcatum* or *H. Aegiceres*) has been recommended as particularly adapted for cold mountainous regions, yielding good crops in the Himalaya at an elevation of 14,000 ft. above the level of the sea. Of the two-rowed B. there are many varieties, of which the common or early English B., the Italian B., and the *Chevalier B.* are among the most esteemed, the latter being in particular demand for the brewing of the finest ales. It takes its name from M. Chevalier, who introduced it. The *Sprat* or *Battledore B.* (*H. zeocriton* of many botanists) is also two-rowed, but is distinguished by the grains standing out from the spike, their awns spreading very widely. It is sometimes called *German rice*, as it swells by boiling in the way that rice does, and for some purposes forms a good substitute for it. It is scarcely cultivated in Britain, but is in much esteem in Germany, and succeeds well in the Alps at an elevation of 3360 ft.

Three species of *hordeum* are natives of Britain, of which one (*H. murinum*), a small grass, is pretty common on waste-grounds, especially in England, and is apt to prove troublesome by its long awns causing inflammation in the mouths of cattle. Still more injurious in this way is the North American *H. jubatum*, or squirrel's tail. Another MEADOW B. or MEADOW B.-GRASS (*H. pratense*), frequent in meadows in England, is reckoned a good pasture grass. *H. bulbosum*, a native of the s. of Europe, and n. of Africa, is cultivated in Britain for herbage, of which it yields a large quantity, much relished by cattle, and particularly by horses. Several species are natives of North America.

BARLEY, CULTIVATION OF. Barley was cultivated largely by the Romans, as well as many other nations of antiquity. Though sometimes used as food by the soldiers, it was most generally used as food for horses. The ancient inhabitants of Gaul prepared a spirituous liquor, a kind of beer, from it. Many of the other western nations latterly applied it to the same use, and it also became an important article of food. Being a plant which is most productive where the climate is moderately dry and warm, the excessive heats of some parts of Europe are adverse both to the quantity and quality of its grain. It is, however, cultivated to a large extent in some parts of the continent where the soil

is specially suited to it, such as in Belgium, Holland, Prussia, and Denmark. Indeed, while most of the countries of Europe send us wheat, it is chiefly Denmark and Silesia that supply us with barley. For this reason, the prices of B. have been relatively higher in this country than those of wheat, since the introduction of free-trade in grain. No country seems to possess a soil and climate so well suited to its growth as many parts of Britain. In former times, this grain was largely used in the British islands as human food; but this is not the case now, except in some parts of Ireland and, in a stray instance, in the highlands of Scotland, where the condition of the population has undergone comparatively little amelioration. In Scotland, however, a considerable quantity is made use of in the making of broth. In this case, the grain is denuded of its husk by the friction of revolving millstones, and goes under the name of pot barley. But the larger proportion of the B. grown in Great Britain, as well as that which is imported, is employed in the distillation of spirits, and in the manufacture of beer, ale, and porter. The moderate qualities are taken up by the distillers, while the brewers of ale and porter require the finest, which are known by the silvery color of the husk, and the specific gravity of the grain. Fine malting B., therefore, always commands a ready demand in the London market, as well as a high price. For several years barley has not only grown better than any other grain with the British farmer, but has commanded relatively the best prices.

Perhaps the cultivation of B. occupies as prominent a share of the arable lands of Suffolk and Norfolk as of any other part of Britain. Fine malting qualities are grown on the turnip-soils of these counties, as well as throughout the s.e. counties, where the four-course rotation is adopted. In this rotation, the B. follows the turnip-crop, which is usually consumed on the land by sheep. The ground is carefully prepared by plowings and rollings, to pulverize it thoroughly before the reception of the seed, which is usually sown by a drill machine at the rate of about two bushels to the acre. On the strong lands of Suffolk and Huntingdon, the B.-crop is sown after a summer-fallow or a green crop, in which case the soil is plowed before the frosts of winter sets in, to render it friable by spring. As soon as the weather permits, after the first week of February, the seed is committed to the ground. A fine mold is in this way obtained, and the crops are usually abundant and of good quality. In the s. of England, the grain is allowed to stand till it is fully ripe, when it is either cut with the scythe or most commonly now with the reaping-machine. In some parts, it is not bound up into sheaves, but remains in the swath for a few days, when it is afterwards carted, and stored into barns. A small portion of the B.-crop is still thrashed out by the flail, owing to the maltsters being under the impression that the thrashing-mills injure the germinating powers. The chief varieties grown in England are the Chevalier, the common, the early English, and the Norfolk. The first named is the most largely sown, as the quality is superior to any other, and, under liberal treatment, the yield is greater. The produce is more influenced by the seasons than that of wheat, as it is liable to suffer from droughts in the early part of the year. On well-farmed land, from 48 to 60 bushels and upwards are got to the acre. In the peaty soils of the fens of Lincolnshire, B. is not raised, as it is too liable to lodge with the rain; neither is B. a favorite crop in the moist climate of the w. of England. It does not endure the rains so well as wheat, nor do so well on highly farmed land. In Wales and Lancashire, it is generally grown after a crop of wheat, and the cultivation and management are not so careful as in the east.

Barley has long been grown in Scotland, and comes to great perfection where the soil and climate are suitable. The level parts of the Lothians and other counties in the s. of Scotland, with Moray, Inverness, and Ross in the n., are the districts in which the finest crops are raised. In these rich districts, B. is commonly sown after a portion of the turnip-break. For this reason, it does not occupy so large a proportional breadth as it does under the Norfolk four-course. The produce is equally abundant, however, and the quality of the grain is often not inferior. Chevalier is the favorite variety there also. The crop, when ripe, is cut by sickle, scythe, or reaping-machine; bound up at once, and put into stooks, to defend it from the weather, till ready to cart, and to be built up in neat round stacks. The grain is invariably thrashed out by machinery. In the higher districts of Scotland, where the soil and climate are not so good, the inferiority of the grain, unless in an especially favorable year, both in quality and quantity is considerable. It is only in fine seasons that the quality is such as to render it an object to maltsters, and in wet, cold unsuitable seasons, distillers can only make use of it at a reduced price. The Chevalier variety is a little late for inferior climates, and the early English and other kinds that come sooner to maturity are often preferred. In Berwickshire, Aberdeenshire, Banffshire, Kincardineshire, and Forfarshire, the five-course rotation—of two years' grass, oats, turnips, and B.—is more generally adopted than in some other counties in Scotland, and a large quantity of this grain is raised, but the quality is generally inferior to that of the crops in e. Lothian. Along the light soils fringing the Moray and Cromarty firths, as fine quality of grain is got as in e. Lothian. Morayshire B. has long been famous for its fine sample, and is in great demand with English brewers. On the other hand, in the less genial climate of the western counties, and also of the upper parts of Aberdeenshire, Banffshire, and Perthshire, less B. is sown, and oats frequently succeed the green crops. In these parts the variety known as bear, or bigg, was for many a day preferred to any other, as it is not so liable to lodge, and it with-

stands wet weather far better, and comes earlier to maturity. Bear, too, is the variety which is cultivated by many of the small cotters in the highlands and islands. Instead of a rotation in which green crops find a place to husband and spare the natural resources of the soil, a succession of corn crops are taken, with an occasional rest to the soil, and then a resumption of the cropping.

As to the manuring of the crop, on the turnip soils of the s. of England, the land is enriched by the droppings of the sheep. In the strong soils of Norfolk and Huntingdon, guano, rape-cake, and other manures abounding in nitrogen, are applied when the seed is sown. In the w. of England, the moist climate renders the application of manures more precarious, and B. is frequently taken after a crop of wheat without any application of fertilizers. When the turnip crop is drawn from the land, as it often is in Scotland, guano is the manure held in most estimation; the quantity applied is from 2 to 4 cwt. per acre. In Berwickshire and Morayshire, as in Norfolk, the prevalence of the five-course shift, and the practice of eating the crop on the ground, secure a sufficiently liberal manuring. In other parts, where B. is taken after wheat, farm-yard manure is often applied, as well as guano and phosphoric manures. In some northern counties, the root crops are laid down with artificial manures, and the roots carted off, farm-yard manure spread on the land and plowed in with the "seed furrow." B. requires a fine tilth and soil in rich manurial condition. The earlier it is sown in the season, the more liberal ought to be the applicatiion of nitrogenous manures. The later it is sown, manures containing nitrogen should be used more sparingly, and a portion of phosphoric manures substituted in their stead.

BARLEY-BREAK, a popular amusement, very common in the reign of James I., and with certain modifications, in name and practice still existing among young persons, both in England and Scotland. Originally, it was played by six people, three of each sex, who were formed into couples. A piece of ground was then apportioned into three parts; and into the center one, called *hell*, a couple was doomed by lot. The sport consisted in the two in the condemned part "catching" one of the other couples while they were in the act of changing places, when the couple caught had to go into the center. It was, however, no easy matter for the two in the center to capture another couple, for by the rules of the game, they were bound to keep united, while the others, when hard pressed, might sever. Thus, sir Philip Sidney, in describing the game, says:

> Soon as the middle two
> Do, *coupled*, towards either couple make,
> They false and fearful do their hands *undo*.

When the whole had been caught, the game was ended, and the last couple taken was said to be in hell. Their punishment appears to have consisted in kissing each other. Herrick says, in referring to the game:

> If kissing be of plagues the worst,
> We'll wish in hell we had been last and first.

In Scotland, the game consisted in one person chasing the rest round the stacks in a farmyard; and when one was caught, he or she had to assist in capturing the rest. The origin of the name is doubtful. Dr. Jamieson suggests that, in Scotland, the locality of the game may have given it its name—"barla-bracks, about the stacks." The same authority also adds: "Perhaps from *barley* and *break*, q., breaking of the *parley*, because after a certain time allowed for settling preliminaries, on a cry being given, it is the business of one to catch as many prisoners as he can." This supposition is not improbable. In the modern games of "shepherds a-warning" and "tig," which appear to have been derived from B., a "barley" means a *parley*.

BARLEYCORN, JOHN, a personification of the spirit of barley or malt-liquor, used jocularly, and also in humorous poetical effusions. There exists a whimsical English tract of old date, under the title of *The Arraigning and Indicting of Sir John Barleycorn, Knt., printed for Timothy Tosspot*, in which sir John is described as of "noble blood, well beloved in England, a great support of the crown, and a maintainer of both rich and poor." See Hone's *Everyday Book*, vol. i.

BARLEY-SUGAR, a confection prepared with sugar and a decoction of barley. See SUGAR.

BARLOW, FRANCIS CHANNING, b. N. Y., 1834; a graduate of Harvard; served in the union armies of the rebellion, and rose to be maj.gen. He has been secretary of state and attorney-general of New York.

BARLOW, JOEL, an American poet and politician, b. in 1755 at Reading in Connecticut. He studied at Yale college in New Haven. He was intended for the profession of the law, but served as a military chaplain during the war of independence. In 1787, he published a poem called *The Vision of Columbus*, which in 1805 appeared anew in an enlarged form as *The Columbiad*. It abounds in beautiful passages, but is overburdened with political and philosophical disquisitions, and disfigured by singularities of expression. B. accepted a commission in 1788 to prosecute the sale of lands for the Ohio company in England and France, where he signalized himself by zealous republicanism; published in 1792 in London a poem entitled *The Conspiracy of Kings*, and endeavored also to work upon the public mind in England by political pamphlets. In autumn 1792

he was deputed by the London reformers, with whom he was associated, to proceed to Paris, where he received the rights of French citizenship. He spent some years on the continent of Europe in political, literary, and mercantile pursuits, and was for a short time American consul at Algiers. He returned to America in 1805, and was appointed ambassador to France in 1811. He died in Oct., 1812, at Zarnawiczc, near Cracow, when on his way to a conference with the emperor Napoleon at Wilna.

BARM. See YEAST.

BAR'MECIDES, or BAR'MEKIDES, a Persian family, distinguished amongst the most powerful in the province of Khorassan, the cradle of the greatness of the Abbaside caliphs, whose cause the *children of Barmek* espoused. *Khaled-ben-Barmek*, the first of these whose authentic history has reached us, was the prime-minister of Abul Abbas Al-Saffah, the first Abbaside caliph; and his influence enduring through the reigns of Al-Mansur and Mohdi, the latter intrusted him with the education of his son, the celebrated Harun Al-Raschid. Yahya, the son of Khaled—according to eastern historians, equally conspicuous for virtue and talent—was made vizier by Harun upon his accession to the caliphate (786 A.D.), and both by his military skill and civil administration, contributed largely to the prosperity of the reign—the caliph himself bestowing on him the appellation of father. Harun, however, afterwards becoming jealous of the growing power and popularity of two of Yahya's sons, Fadhl and Jarfar (the Giafar of the *Arabian Nights*), had them executed, and the whole of the B. throughout the kingdom arrested, and their goods confiscated. Harun even carried his enmity so far as to forbid the mention of their name on pain of death, but their virtues and their glory are celebrated by almost all Mohammedan poets and historians.

BAR'MECIDE'S FEAST, a phrase originating most probably in the story of the barber's sixth brother, recorded in the *Arabian Nights*, and abridged in the *Guardian*, No. 162. The substance of the story is as follows: One Schacabac being in great want, and not having tasted food for two days, ventured to visit a rich Barmecide (see BARMECIDES) noted both for his hospitality and eccentric humor, in the hope of generous entertainment. The Barmecide, on learning his condition, invited him to dinner. Schacabac was presented with an empty plate, requested to "make himself at home," and by and by, asked "how he liked his rice-soup." It was apparently a cruel jest to play off on a starving man. Schacabac, nevertheless, feigned to enter into the humor of his host, and expressed his conviction that the rice-soup was delicious. The Barmecide continuing the imposition, next asked his victim if he ever saw whiter bread. Poor Schacabac, who saw neither bread nor meat, nor indeed anything eatable, made a prodigious effort to look happy; he even went the length of gently remonstrating with his host for not supposing him completely satisfied. In this way a magnificent but fictitious dinner was disposed of. When wine, however, was produced, Schacabac pretended only to taste it on the ground that he was "quarrelsome in his liquor," and might do his host an injury. The Barmecide forced him, however, and at last Schacabac, who was really in a most excusable rage at being so elaborately tantalized, feigned to have got flustered, and gave the eccentric old gentleman "a good box on the ear." This put a stop to the joke. The Barmecide was mightily pleased with the patient humor of his guest, a visible dinner was immediately ordered up, and Schacabac now enjoyed in reality what he had previously partaken of only in imagination.

BAR'MEN, a most charming valley, about leagues in length, on the Wupper, about 2 leagues from Elberfeld, in the province of Rhenish Prussia. It is divided into upper and lower B., and contains five towns or villages, which united form the town of B., now continuous with Elberfeld, with (1875) 86,504 inhabitants, chiefly Protestants. Nowhere in Germany is so much manufacturing industry accumulated in a single spot. B. is the principal seat of the ribbon-manufacture on the continent. Its fabrics go to all parts of the world. It produces linen, woolen, cotton, silk, and half-silk ribbons, cloth of various kinds, stay-laces, thread, etc. It has also considerable manufactures of soap, candles, metal wares, buttons, machinery, and pianofortes. There are, besides, in the valley, numerous bleachfields and Turkey-red dye-works. Lower B. has a mineral spring and a bathing establishment.

BARNABAS, SAINT, properly Joses, mentioned in the Acts of the Apostles as a fellow-laborer of Paul, and even honored with the title of apostle. He is also supposed to have founded the first Christian community at Antioch. According to tradition, he became the first bishop of Milan, but he is differently reported to have died a natural death, and to have suffered martyrdom at the hands of the Cypriot Jews, 61 A.D. The epistle ascribed to him is of very doubtful authenticity.

BARNABAS, SAINT, EPISTLE OF. This epistle contains 21 chapters. Its aim is obviously to strengthen the faith of believers in a purely spiritual Christianity. It commences by declaring that legal sacrifices are abolished, and then proceeds to show, though not in a very coherent or logical manner, how variously Christ was foretold in the Old Testament. In the 10th chapter, it spiritually allegorizes the commands of Moses concerning clean and unclean beasts; in the 15th, it explains the "true meaning" of the Sabbath; and in the 16th, what the temple really prefigured. This concludes what may be termed the doctrinal portion of the epistle; the remainder, which is of a practi-

cal character, describes the two ways of life—the way of light and the way of darkness, and closes with an exhortation that those who read it may so live that they may be blessed to all eternity. It is a simple, pious, and earnest work; but makes a far more judicious use of the New Testament than of the Old.

BARNABITES, an order of monks which sprung up at Milan in 1530. They were so called because the church of St. Barnabas in that city was granted them to preach in. They were approved of by pope Clement VII. and pope Paul III. Their special duties were, to attend the sick, to preach, to instruct the young, and to take the charge of souls. They soon established themselves in Italy, France, Austria, and Spain, and enjoyed the privilege of teaching theology in the schools of Milan and Pavia. Many eminent men have been sent forth by them. Besides the three usual monastic vows, they took a fourth, viz., not to sue for church preferments. In France and Austria they were employed in the conversion of Protestants; but they have now, as a body, almost fallen into oblivion. Only a few monasteries exist here and there in France and Italy.

BARNABY LECTURES, of the university of Cambridge, where four persons are chosen annually on St. Barnabas day to lecture on mathematics, philosophy, rhetoric, and logic.

BARNACLE, or BERNICLE, *Lepas*, also called *Anatifa* and *Pentalasmis*, a kind of shell-fish, a genus of *cirrhopoda* (q.v.), the type of a family of articulate animals distinguished by a long flexible stalk or peduncle, which is provided with muscles, upon the summit of which, in the true barnacles, are shelly valves five in number, inclosing the principal organs of the animal, and opening and closing on one side like the opercular valves of *balanus* (q.v.), to admit of its spreading out and retracting its net—an apparatus similar to that by which the animals of that genus obtain their food. Barnacles abound in almost all seas, attaching themselves in great numbers to logs of wood, ships' bottoms, etc. They grow very rapidly. Some of the species are eaten in some parts of the world, and perhaps they were among the *balani* which the ancient Romans esteemed a delicacy.—In some cirrhopods, very nearly allied to the true barnacles, and resembling them in general form, the shelly valves almost entirely disappear.

In former times, the B. was supposed to be the embryo of a goose or bird of some kind; a notion which doubtless arose from a fancied resemblance between the convolutions of the fish in its shell and the embryo of a bird in the egg. It was, therefore, believed that the barnacle goose, described in next article, sprung from these marine shells. Hollinshed gravely affirms that such was the case; and the most learned men of their time were weak enough to give credence to the absurdity. Gerard, in his *Herbal* (1597), declares, that after "a thing in form like a lace of silke finely woven, as it were, together"—which he correctly enough states to be "the first thing that appeareth" when "the shell gapeth open"—there next follow "the legs of the bird hanging out;" and at last the bird, increasing in size, "hangeth only by the bill," and "in short space after it cometh to full maturity, and falleth into the sea, where it gathereth feathers, and groweth to a fowl bigger than a mallard, and lesser than a goose," etc. All this was represented as constantly taking place on the coast of Lancashire and the Hebrides, and continental writers of greater name reported in like manner the same fable, against which Ray and other early naturalists were obliged seriously to argue. The B., however, really undergoes transformations not less wonderful than the fabled ones, which have rendered it an object of so much interest. See CIRRHOPODA.

BARNACLE GOOSE, or BERNICLE GOOSE, often also called BARNACLE, or BERNICLE (*anser bernicla* or *leucopsis*), the bird which the fables of former days represented as deriving its origin from the cirrhopod of which it bears the name. It is in size smaller than the common wild goose, being only a little more than 2 ft. long, and about 5 lbs. in weight. It is very prettily marked, having the forehead, cheeks, and throat white, the bill black, and a black stripe extending from it to the eye; the crown of the head, neck, and upper part of the breast black; the rest of the plumage on the upper parts of the body chiefly ash-gray and black, in undulating bars—on the lower parts, white. It is a common winter visitant of the western coasts of Britain and of Ireland, but in the eastern parts of Britain it is rare. It retires in spring to more northern regions, where it breeds, vast numbers passing northward along the coast of Norway to the Arctic ocean. It is highly esteemed for the table.

The brent goose, or brent barnacle (*anser brenta* or *torquatus, A. bernicla* of some naturalists), has frequently received the name of the B. G., and no little confusion has existed concerning them in books of science, although the birds are sufficiently distinct. The bent goose is smaller than the B. G., being only about 21 in. in length. It is also of much darker plumage, the whole head, throat, and neck being black, except a small patch on each side of the neck, which is white, mixed with a few regularly placed black feathers; the upper parts of the body generally almost black, and the lower parts slate-gray, except the vent and under tail-coverts, which are white. It is remarable for length of wing and powerful flight, and for its distant migrations. It is very common in winter on the British shores, but breeds in high northern latitudes. It is a winter-bird of passage in the United States and Canada, as in Britain and on the continent of Europe. It is excellent for the table.

Very nearly allied to these species is the red-breasted goose, or red-breasted barnacle (*anser ruficollis*), a beautiful bird, of which the neck and upper part of the breast are of a rich chestnut red. In size, it resembles the brent goose; it is a very rare visitant of Britain and of the continent of Europe, and is abundant only in the extreme n. of Asia.—Another species, called Hutchins' goose or barnacle (*A. Hutchinsii*), of dark plumage, and with a triangular patch of white on each side of the head and neck, is abundant in Hudson's bay, and the extreme n. of America.

These species are regarded by some naturalists as constituting a genus *bernicla*, distinguished chiefly by a shorter and more slender bill from the ordinary or true geese.

The Egyptian goose or bargander (*anser Egyptiacus*) is sometimes ranked with these, sometimes made the type of a distinct genus, *chenalopex*, upon account of the longer bill, a short spur with which the bend of the wing is armed, and the anatomical peculiarity of a hollow bony enlargement at the bottom of the trachea of the male. It has long been kept in parks and pleasure-grounds in Britain, chiefly on account of the beauty of its plumage, and has become partially naturalized. It is a little smaller than a common goose; its voice more resembles that of a wild-duck. The prevailing colour of the plumage is light chestnut-brown, minutely rayed with darker lines; the neck and part of the wings are white. Large chestnut patches surround the eyes. It is very abundant on the Nile, and is frequently figured in Egyptian sculptures. It is much esteemed for the table, and was kept and fattened for it by the ancient Egyptians. It is the *chenalopex* of Herodotus.

BARNACLES, in heraldry, resembling what are now called twitchers, were instruments used by farriers to curb and command unruly horses. B. are frequently introduced into coats of arms as a charge.—The term BARNACLES, applied to spectacles, is derived from *beryllus*, a transparent stone; dim. *beryllicula, berynicula, bernicula*. Old Fr. has *béricle;* the dialect of Berri, *berniques*. Twitchers resembled the original spectacles that clasped the nose.

BARNARD, FREDERICK AUGUSTUS PORTER, S.T.D., LL.D., L.H.D., b. Mass., 1809; graduated at Yale in 1828; in 1831, teacher in the Hartford deaf and dumb asylum; 1837–48, professor of natural philosophy and mathematics in the university of Alabama, and of chemistry until 1854, when he took orders in the Episcopal church. In 1855, he was professor of astronomy and mathematics in the university of Mississippi, and president of that institution in 1856. He became president of Columbia college, N. Y., in 1864, and is in office now (1880). He was U. S. commissioner to the Paris exposition of 1867, and published a report on machinery and industrial arts, in 1869. He is author of a *Treatise on Arithmetic, Analytical Grammar with Symbolic Illustration, Letters on Collegiate Government, History of the U. S. Coast Survey, Recent Progress of Science, The Metric System*, and various smaller papers. In 1860, he was one of the party sent to Labrador to observe an eclipse of the sun; in 1862, he was at work on the reduction of Gillis's observations of the stars of the southern hemisphere; in 1863, he superintended the publication of maps and charts of the U. S. coast survey; he was president of the American association for the advancement of science in 1860; a member of the board of experts of the bureau of mines in 1865; and a member of the American institute in 1872. He is a member of many distinguished societies in other countries, and also a frequent contributor to home and foreign scientific publications.

BARNARD, HENRY, LL.D., b. Conn., 1811; graduate of Yale; admitted to the bar in 1835; member of the Connecticut legislature, 1837–40, where he labored for common school and prison reform; eight years superintendent of schools, when he improved school buildings, established teachers' institutes, high schools, and a normal school. He was also school commissioner for Rhode Island; in 1857, became president of Wisconsin state university, but soon resigned for ill health; afterwards president of St. John's college, Md.; in 1867–69, U. S. commissioner of education. He is author of six works on schools, and has edited two or more journals in the interest of education.

BARNARD, JOHN, 1681–1770; a graduate of Harvard; chaplain of the Port Royal expedition; was offered appointment as chaplain in England, but refused to conform; ordained at Marblehead, Mass., in 1716, and held that pulpit through his life. He published a version of the Psalms, and was active in promoting the business interests of the town.

BARNARD, Sir JOHN, 1685–1764; an English merchant; represented London in parliament for 40 years; was knighted in 1732, and was lord mayor in 1737. He was the originator of a scheme for reducing the English national debt. There is a statue of him in the royal exchange.

BARNARD, JOHN GROSS, LL.D., b. Mass., 1815; brother of Frederick A. P.; military engineer of West Point, 1833; employed as constructing engineer until 1846, rising to col. of engineers and brevet maj.gen. of the U. S. army. In the Mexican war he fortified Tampico. In 1851, was chief engineer of the Tehuantepec survey; in 1856, superintendent of West Point academy; and for four years in charge of the defense of New York. In the rebellion he superintended the defenses of Washington. On gen. Grant's staff he was chief engineer of the armies in the field, and since the war has been a member of the boards having charge of fortifications and river and harbor obstruc-

tions. He has published *Problems in Rotary Motion, Dangers and Defenses of New York, Notes of Sea Coast Defense, The C. S. A. and the Battle of Bull Run, Artillery Operations of the Army of the Potomac*, etc.

BARNARD CASTLE, an inland t. in the s. of Durham co., on the right bank of the Tees, about 40 m. from its mouth, and 26 m. s.w. of Durham. It stands on the slope of an eminence rising from the river. Its chief manufactures are hats, carpets, shoemakers' thread, leather, plaids, and stockings. It has one of the largest corn-markets in the n. of England. On a rocky height over the river are the ruins (covering 6¾ acres) of a castle, founded about 1180 by Barnard, son of Guy Baliol, a follower of the conqueror, and ancestor of John Baliol, king of Scotland, who was born in the castle, and founded an hospital for the poor in the town. B. C. is the scene of part of sir W. Scott's poem of *Rokeby*. Pop. '71, 4306.

BARNAUL', a t. of w. Siberia, in the government of Tomsk. It is situated at the junction of the Barnaul with the river Oby, and has a pop. of (1867) 12,928, who are chiefly engaged in the mining and smelting of the metals found in the vicinity, which consist of silver, lead, and copper. B. has 120 furnaces at work, is the seat of a mining board, and has a magnetic and meteorological observatory.

BARNAVE, ANTOINE-PIERRE-JOSEPH-MARIE, a distinguished character and victim of the French revolution, was b. at Grenoble in 1761, was the son of an advocate, adopted his father's profession, and early attracted attention in the parliament of Grenoble by the talents which he displayed. A pamphlet which he published against the feudal system led to his being returned as deputy from his province to the states-general in 1789. He zealously advocated the proclamation of the rights of man, was vehement in opposition to the absolute veto, carried through the confiscation of church property to the use of the nation, the emancipation of the Jews, and the abolition of the religious orders, and was mainly instrumental in the liberation of the slaves and reorganization of the colonies. As a leader of the extreme party in the earlier stages of the revolution, he became the idol of the people, and particularly after his victory over Mirabeau, in the question of the power of peace and war, which Mirabeau wished to remain with the king, and B. successfully claimed for the national assembly. He subsequently, however, became inclined to a more moderate course, defended the inviolability of the king's person, and resisted the assertion by the assembly of power to remove ministers. This conduct led to his being regarded as a renegade from the national party, and to his being assailed by the fierce vituperations of the daily press. He retired to his native place on the dissolution of the national assembly; but after the 10th of Aug., 1792, he was impeached, along with Lameth and Duport-Dutertre, on account of correspondence with the court; was brought to Paris, tried before the revolutionary tribunal, condemned, and guillotined on the 29th of Nov., 1793.

BARNBURNERS, a section of the democratic party in New York about 1848, opposed to the extension of slavery, and supported Van Buren for president against Cass, the regular nominee. Their vote, dividing the democratic strength, gave New York, Connecticut, and Massachusetts to Taylor, the whig nominee, and secured his election. The name was suggested by the story of the farmer who burned his barn to clear it of rats. The other section of the democracy in New York was called "Old Hunkers."

BAR'NEGAT, a village in Ocean co., N. J., frequented by sportsmen in search of wild fowl, and peopled chiefly by seamen. It has an academy, and is a good place for sea-bathing

BAR'NEGAT BAY, on the Atlantic, in Ocean co., N. J., 23 m. long and 1 to 4 m. wide, separated from the ocean by Squan beach. At the mouth is a light-house, 39° 45′ 48″ n., 74° 6′ 3″ w., showing a white flashing light.

BARNES, a co. in e. Dakota, crossed by the North Pacific railroad and by the Sheyenne river; 1584 sq.m.; pop. '80, 1615. It is an agricultural region, raising wheat being the chief business. The river affords good water-power. Co. seat, Valley City; pop. 527.

BARNES, ALBERT, an American theologian, b. in the state of New York, in 1798. He was minister of the first Presbyterian church of Philadelphia, from 1830 to 1867. He is best known by his *Notes* on various parts of the Old and New Testaments, specially adapted for the use of Sunday-schools and Bible classes, which have had an extraordinary circulation. Two editions of 18 vols. were published in England, 1860–62. Mr. B. d. at Philadelphia, 1870.

BARNES, ALBERT (*ante*), 1798–1870; b. N.Y.; a theologian; graduate of Hamilton college and of Princeton seminary; licensed to preach in 1823, and after occupying pulpits in several New Jersey towns, was called to the First Presbyterian church in Philadelphia, where he officiated more than 30 years, resigning only because of failing eyesight. He was a thoughtful and spiritual preacher, but is better known for his *Notes* on various books of the Bible, those on the New Testament having at one time a wider circulation than any similar work. Just before he died he had completed a new version of the *Notes*, with many additions, which was published in six vols. in 1871–72. During

the disruption of the Presbyterian church, he was tried for heresy and silenced for a short time, but the accusation failed to command public assent. In the final separation he went with the new school side, and was among the most liberal of their leaders. He was also a firm, though never violent, opponent of slavery. Besides the *Notes*, and many articles in periodicals, B. is author of an introduction to *Butler's Analogy*, *Scriptural Views of Slavery*, *The Way of Salvation*, *The Atonement*, *Claims of Episcopacy*, *Church Manual*, *Lectures on the Evidences of Christianity in the Nineteenth Century*, *Prayers for Family Worship*, several volumes of sermons, and a series of Sunday-school manuals. He was noted for a balanced judgment, and for Christian meekness and fidelity.

BARNES, JAMES, 1806–69; b. Mass.; a graduate of West Point in 1829; a prominent military and civil engineer. In the civil war he was col. and brig. gen. of volunteers, and brevet maj.gen. He was wounded at Gettysburg, and died in Springfield, Mass., from disease contracted in the service.

BARNES, JOSEPH K., b. Philadelphia, 1817, surgeon and brig.gen. in the U. S. army; appointed surgeon in 1856; in 1863, medical inspector; in 1864, surgeon-general.

BARNES, Rev. WILLIAM, poet and philologist, is author of three collections of poems written in the dialect of Dorsetshire, the first entitled *Poems of Rural Life in the Dorset Dialect, with a Dissertation and Glossary* (Lond. 1844); the second, *Hwomely Rhymes*, etc. (Lond. 1859); and the third, *Poems of Rural Life*, etc. (Lond. 1862). The first of these collections reached a second edition in 1847, showing that at least some interest was taken even at that early period in Mr. B.'s "hwomely rhymes." They were not critically noticed, however, so far as has been ascertained, until Nov. 1859, when a highly eulogistic review of them appeared in the *North British Review*, pronouncing Mr. B. to be "the best writer of rustic eclogues since Theocritus." The reviewer also says, speaking of Mr. B.'s poetry, "that it combines in a high degree the special merits of Wordsworth and Burns, but in a way which is so perfectly original, as to bear no trace of even a perusal of those poets by the author." Such praise, although exaggerated, is not altogether without foundation. Mr. B. is a true poet, combining with a genuine love of nature, as seen in the rich grazing-lands of Dorsetshire, a keen sympathy with the rustic population, their hopes and fears, loves, joys, sorrows, and superstitions. It is for this audience that Mr. B. professed to write, and it is only such that can thoroughly appreciate his verse. He has, however, also written a collection of poems, called *Poems of Rural Life in Common English* (1868). Attention was again called to Mr. B.'s poems by a writer in *Macmillan's Magazine* for June, 1862, in an article evidently from the same pen as that in the *North British*, and claiming for Mr. B. a place "at the very head of the properly idyllic poetry of England." In that article, we are informed that in the previous year (1861), the pension-list, which announced a yearly grant of £50 to Mr. Close, in consideration of his deserts *as a poet*, mentioned one scarcely larger in amount conferred on Mr. B. in consideration of his acquirements *as a philologist*. Mr. B. was born of humble parentage at Rush-hay, Bagber, Dorsetshire, in 1810, and was for many years master of the grammar-school at Dorchester. He is B.D. of St. John's college, Cambridge, was ordained in 1847, and was promoted from the curacy of Whitcombe to the rectory of Winterbourn-Came, in Dorset, in 1862. Besides the collections of poems mentioned, Mr. B. is author of *An Investigation of the Laws of Case in Language* (Lond. 1840); *An Arithmetical and Commercial Dictionary* (Lond. 1840); *The Elements of English Grammar* (Lond. 1842); *The Elements of Linear Perspective* (Lond. 1842); *S. Geflysta (the Helper): an Anglo-Saxon Delectus* (Lond. 1849); *Notes on Ancient Britain and the Britons* (Lond. 1858); *Views of Labor and Gold* (Lond. 1859); *The Song of Solomon in the Dorset Dialect, from the authorized English Version* (Lond. 1859)—printed at the expense of prince Louis Lucien Bonaparte; *Tiw, or a View of the Roots and Stems of the English as a Teutonic Tongue* (Lond. 1862); *Early England and Saxon English* (1869). The philological works of Mr. B. show considerable learning and ability.

BARNET, CHIPPING, a t. in the s. of Hertfordshire, on a hill-top, 11 m. n.n.w. of London. Pop. '71, 3720. It was formerly a place of importance on the great northern coach-road. Large cattle-fairs are held here. Here, in 1471, was fought the famous battle of B. between the Yorkists and Lancastrians, in which the latter, after a desperate struggle, were routed, and their leader, Warwick, "the king-maker," killed, by which event Edward IV. was firmly established on the throne. A commemorative obelisk is now erected near the spot.

BARNEVELDT, JAN VAN OLDEN, grand pensionary of Holland, b. 1547, early showed great ardor in the cause of the independence of his country. As advocate-general of the province of Holland, he proved equally his insight into affairs and his address in diplomatic management. Penetrating the secret designs of prince Maurice (q.v.) of Orange, he became the head of the republican party, which aimed at subordinating the stadtholder to the legislature. It was he also who opposed the warlike tendencies of Maurice, concluded (1609) a truce with Spain, and prevented the states-general from taking part in the revolt of the Bohemians. His influence excited the house of Nassau to still greater jealousy, which in the religious controversies between the Remonstrants (see ARMENIUS) and Gomarists degenerated into the bitterest hostility. With the view of obviating a civil war, B. proposed an ecclesiastical assembly, which resulted in agreeing

to a general toleration in respect of the disputed points. The states at first concurred in this wise measure; but the intrigues of the Orange party brought about a change of views by representing the Remonstrants as secret friends of Spain. B., who sympathized with the more tolerant principles of that party, was attacked in scurrilous publications, and was insulted even in the meeting of the states by the mob, with whom Maurice was an idol. The strife between the Remonstrants and Gomarists became hotter every day, and threatened to end in civil war. On Aug. 29, 1618, B. was illegally arrested, along with Grotius and Hoogerbeets, and thrown into prison. In the following Nov., Maurice procured the summoning of the synod of Dort (q.v.), which condemned the Remonstrants with the utmost rigor and injustice. In Mar. 1619, while the synod was still sitting, B. was brought to trial before a special commission of 24 judges, who condemned as a traitor the innocent man to whom his country owed its political existence. It was in vain that his friends and relations raised their voice; equally vain was the interference of the Dowager princess of Orange and of the French ambassador; Maurice was not to be moved. On May 13, 1619, the venerable man of 71 years of age mounted the scaffold, and laid down his head with the same firmness that he had shown through all the events of his life. His sons, Wilhelm and René, were at the same time dismissed from office. Four years after their father's death they took part in a conspiracy against the life of the prince, which, however, was discovered. Wilhelm escaped to Antwerp, but René was seized and beheaded.—See Motley's *Life of B.* (2 vols. Lond. 1874).

BARNEY, Joshua, 1759–1818; b. Baltimore. Before he was 17 years old he was made lieutenant, for gallant service in capturing an English brig in Delaware bay. During the war of the revolution, in which he was three times taken prisoner, but exchanged, he made some important captures, particularly that of the *Gen. Monk*, of 20 guns, off the cape of Delaware in 1782. In that vessel he went to France and brought back a large amount of money, a loan by France to the colonies, and also news that the preliminaries of peace were agreed upon. He was made a captain in the service of France in 1795, but resigned in 1800. In the war of 1812 he commanded the fleet that defended Chesapeake bay, and was wounded in the battle of Bladensburg. In 1818, he started for Kentucky, where he intended to settle, but died on the way.

BARNSLEY, a t. in the West Riding of Yorkshire, 39 m. s.w. of York. It is situated on a hill, has coal and iron mines, linen manufactures, bleaching and dye works, manufactures of iron and steel, wire-works, and glass-works. Besides ample railway communication, it has the advantage of two canals. It has a large number of educational and benevolent institutions, and a public park of about 20 acres. Among the chief buildings are the county court and bank. Pop. '71, 23,021.

BARNSTABLE, a co. in s.e. Massachusetts, including cape Cod and some islands; 290 sq.m.; pop. '80, 31,945. Its surface is low and level. Most of the inhabitants are fishermen and seamen. Co. seat, Barnstable.

BARNSTABLE, a t. and seat of justice of B. co., Mass., on B. bay, 65 m. s.e. of Boston; pop. '80, 4,250. Its inhabitants are mostly fishermen and seamen.

BARNSTAPLE, a t. in n.w. Devonshire, on the right bank of the Taw, 6 m. from its mouth, and 34 n.w. of Exeter. The Taw is here crossed by an ancient bridge of 16 arches, which has been widened by iron-work on each side. In consequence of the river and harbor having become filled up with sand, much of the trade of B. has been transferred to Bideford. It has manufactures of pottery and lace. It sends two members to parliament. B. has existed since the reign of Athelstan, who built a castle here. The poet Gay was born near the town, and educated at its grammar-school. Pop. '71, 11,790.

BARNUM, Phineas Taylor, American showman, was b. at Bethel, Conn., July 5, 1810. His father was a tavern-keeper; and while young B. attended the village school, he traded with and played practical jokes upon his father's customers. At the age of 13, he was employed in a country store; and about five years afterwards, went largely into the lottery business. When only 19, he married clandestinely, and then moved to Danbury, where he edited *The Herald of Freedom*, and was imprisoned 60 days for a libel. In 1834, he removed to New York, where, hearing of Joyce Heth, nurse of gen. Washington, he bought her for $1000, and with the aid of forged documents and puffing, exhibited her to considerable profit. Reduced again to poverty, he sold Bibles, exhibited negro dancers, and wrote for newspapers, until he bought the American Museum in New York, which he raised at once to prosperity by exhibiting a Japanese mermaid, made of a fish and monkey, a white negress, a wooly horse, and finally, a noted dwarf, styled gen. Tom Thumb, whom he exhibited in Europe in 1844. In 1847, he offered Mademoiselle Jenny Lind $1000 a night for 150 nights, and received $700,000 —the concert tickets being sold at auction, in one case for $650 for a single ticket. He built a villa at Bridgeport, in imitation of the Brighton pavilion, and engaged in various speculations, one of which—a clock-factory—made him bankrupt. Settling with his creditors in 1857, he engaged anew in his career of audacious enterprises, and made another fortune. In 1866, he stood as a candidate for a seat in congress, but was unsuccessful. His *Autobiography* (1854, since greatly enlarged) has the merit at least of frankness. In 1865, he published *The Humbugs of the World;* and *Struggles and Triumphs* in

1869. In 1871, he again returned to the business of showman, from which in 1868 he had withdrawn. His exhibition of a "petrified man" in 1878 was not a success.

BARNWELL, a co. in s.w. South Carolina, separated from Georgia by the Savannah river; 1550 sq.m.; pop. '80, 39,858—26,010 colored. The soil is fertile and produces wheat, corn, oats, cotton, rice, etc. Co. seat, B. Court House.

BAROACH', BROACH, or BHARUCH, a large t. of British India, in the province of Bombay. It is situated on an elevated mound, supposed to be artificial, on the n. bank of the Nerbudda. The Nerbudda is here a noble river, 2 m. wide even at ebb tide, but shallow, and the navigable channel winding and difficult even at high water. It abounds in fine fish. B. is a very ancient town; it is supposed to be the *Barygaza* of Arrian. Situated in the midst of a most fertile district, it was formerly a very flourishing town, with a large population; but fell, in consequence of political troubles, into decay. It has of late begun to recover prosperity, and its commerce is increasing. Its present pop. is estimated at 15,000, within the walls; but including the suburbs, which are extensive, the pop. in 1872 was 36,963. B. belonged to the Mussulman kingdom of Guzerat, on the overthrow of which by the emperor Akbar, it was assigned to a petty nawab; and falling under the dominion of the Peishwa, was taken by the British in 1772, ceded to Scindiah in 1783, in acknowledgment of the kind treatment of some British prisoners; and again stormed by a British force in 1803, since which date it has remained in the possession of the British. The heat of B. is often excessive, and the situation is regarded as unhealthy. B. carries on a considerable trade with Bombay and Surat—the principal exports being raw cotton, grain, and seeds. It was long famous for its manufactures of cloth; but that of the finer kinds has fallen off very much, in consequence of the importation of English goods. Many of the weavers of B. are Parsees, of whom also some are of the more opulent classes—as ship-owners and ship-brokers. B. has one remarkable institution—a Brahmanical hospital for sick animals, into which horses, dogs, cats, monkeys, peacocks, and even insects are received. It is ostensibly attended by a number of Brahmans, who derive a good income from lands devoted to it, and from voluntary contributions. Pop. of collectorate (1872) 350,322.

BAROC'CHIO, or BAROZZI GIACOMO DA VIGNOLA, 1507–73; an Italian architect, who succeeded Michael Angelo as the architect of St. Peter's, and constructed other great works in Rome. He also supplied the designs for the Escorial. His *Five Orders of Architecture* is an excellent and useful work.

BAROCHE, PIERRE-JULES, an eminent French politician, was b. at Paris on the 8th Nov., 1802. He passed as an advocate in 1823, and distinguished himself by his talents as a pleader. In 1847, he was sent to the chamber of deputies as representative of Rochefort, took his position among the moderate reform party, and was one of those who signed the accusation drawn up against the Guizot ministry. During the republic, he voted at first along with the democratic party, but subsequently supported gen. Cavaignac, and, after the 10th Dec., the politics of Louis Napoleon. B. was now made procureur-général of the republic at the Paris appeal court. In Mar., 1850, he succeeded Ferdinand Barrot as minister of the interior, after which he became a decided Bonapartist. In April, 1851, he was appointed minister of foreign affairs, with Leon Faucher as colleague. After the *coup d'état* of the 2d Dec., 1851, B. accepted the vice-presidency of the consultative commission, and was authorized to make known officially the result of the *plebiscitum*. He became minister of foreign affairs in 1860, and minister of justice and public worship in 1863. He received the grand cross of the legion of honor in 1855. His death took place on the island of Jersey in 1870.

BARO'DA, a city of Guzerat, and capital of a state of the same name. It is 40 m. from Tunkaria and 231 n. of Bombay, with which it is connected by railway. It stands on the Biswamintri, which is here crossed by a stone bridge of singular construction—an upper range of arches resting on a lower one. B. is the residence of the Guicowar, a protected Mahratta prince. Pop. '72, 112,057; trade considerable. It occupies an important position between the coast and the interior. In 1873, numerous complaints having been made to the British government about the misrule of the Guicowar, Malhar Rao, a commission was appointed to examine into the state of affairs, and as a result the Guicowar was allowed 18 months in which to reform his administration. His misrule, however, continued, and a suspected attempt to poison col. Phayre, the British resident at his court, led to his arraignment before a mixed British and native tribunal in 1875. The court was divided in opinion as to his guilt, but the British government deposed the Guicowar for his obvious misrule.

BAR OF DOWER. Dower, the estate or provision which, by the law of England, a widow is entitled to out of the lands and tenements of her deceased husband, may be barred or defeated by her elopement, her divorce on the ground of her own adultery, the treason of her husband, and other disabilities, and by detaining the title-deeds or evidences of the estate from the heir until she restores them. A woman might also, while fines and recoveries were in force, be barred by these assurances, as she now may by the new method of conveyance appointed by the statute 3 and 4 Will. IV. c. 74, in substitution for a fine or recovery, in the case of a married woman. And another method of barring dower is by jointure, as regulated by the statute 27 Henry VIII. c. 10—Stephen's *Commentaries*, vol. i. p. 273. See DOWER, JOINTURE, WIDOW, and FINE OF LANDS.

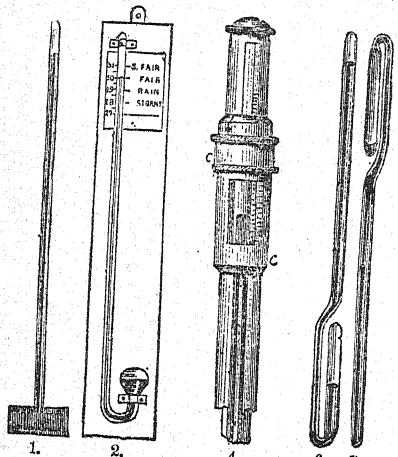
The term corresponding to dower in Scotch law is Terce (q.v.), which may also be barred or excluded in various ways; as, for instance, by the widow's express discharge or renunciation, by the deeds of the husband affecting his real estate, by the husband's conviction for treason, by the wife's express acceptance of a different provision in lieu of the terce, and by her divorce on the ground of adultery.

BAROMETER (Gr. *baros*, weight; *metron*, a measure), an instrument for measuring the weight or pressure of the atmosphere. The term is generally understood to refer to one in which the measure is the height of a column of liquid sustained by atmospheric pressure. The fundamental principle of the construction of the B. is best shown in the experiment which led Torricelli to the first discovery of the pressure of the air. A glass tube, about 33 in. in length, open at one end, is completely filled with mercury, and, being firmly closed by the thumb, is inverted and placed vertically in a cup containing mercury. When the thumb is removed, the mercury sinks in the tube till it stands, generally, about 30 in. above the level of the mercury in the cup, leaving in the upper part a space free of air, which receives the name of the Torricellian vacuum (fig. 1). The mercury within the tube being thus removed from the pressure of the air, while that in the cup is exposed to it, the column falls, till the pressure at the section of the whole, in the same plane as the surface of the mercury in the cup, is the same within and without the tube. A similar experiment is seen when, in a U-shaped tube, having one branch much wider than the other, a column of mercury in the narrow branch balances a column of water nearly 14 times as high in the other. In the Torricellian experiment, we have the air and the space occupied by it taking the place of the wide water branch of the U-shaped tube, and the glass tube and mercury forming the narrow branch, as before; the narrow branch, however, in this case being closed above, to prevent the air from filling, as it were, both branches. In both cases, the heights of the columns are inversely as the specific gravities of the liquids of which they consist; and, as air is about 10,000 times lighter than mercury, we should have the aërial column 10,000 times 30 in. high. It will be found, under ATMOSPHERE, that from the air lessening in density as it ascends, the height is considerably greater. Any changes that take place in the height or density of the aërial column will be met by corresponding changes in the height of the mercurial column, so that as the latter rises or falls, the former increases or diminishes. We have, then, in this simple tube, an infallible index of the varying amount of atmospheric pressure, and, in fact, a perfect barometer. The changes, however, are indicated on a scale at least 10,000 times diminished, so that the variations in the tube show very considerable changes in the weight of the atmosphere. If water be used instead of mercury, the water column would be 14, or, more correctly, 13.6 times as high as the mercurial column, or about 34 ft.; and the scale on which the changes take place would be correspondingly magnified, so that a water B. should be much more delicate than a mercurial one. Water is, however, exposed to this serious objection, that its vapor rises into the empty space above, and causes by its elasticity a depression of the column, the depressions being different for different temperatures. At zero, Fahrenheit, for instance, the depression thus arising would be $\frac{1}{2}$ an inch, and at 77°, more than 1 foot. It would be doubtful, likewise, at the time of any observation, whether the space referred to was filled with vapor of the elasticity corresponding to the observed external temperature or not, so that the necessary correction could not with certainty be made. The vapor of mercury, on the other hand, at 77° F.—a temperature considerably above the average—produces in the B. a depression of only $\frac{1}{1\frac{1}{5}\frac{1}{0}}$ of an inch, an amount practically inappreciable. After 200 years of experience and invention, we have yet no better index of the pressure of the atmosphere than the simple mercurial column of Torricelli, and in all exact observations it is taken as the only reliable standard.

Simple as the B. is, its construction demands considerable care and experience. It is of the first importance that the mercury to be used is chemically pure, otherwise its fluidity is impaired, and the inside of the tube becomes coated with impurities in such a way as to render correct observation impossible. Mercury, as usually sold, is not pure; and before being employed for barometers, must be shaken well with highly dilute but pure nitric acid, to remove extraneous metals and oxides. The same object is effected more thoroughly by keeping it several weeks in contact with the dilute acid, stirring every now and then. After either process, the metal must be thoroughly washed with distilled water, and dried. In filling the tube, it is essentially necessary to get the column free from air and moisture. To effect this, the mercury, after filling, is boiled in the tube, so that air and moisture may be expelled, partly by the heat, and partly by the vapor of the mercury. This process demands great experience and skill, but the same end may be more easily and as effectually attained by boiling the mercury, in the first instance, in an atmosphere of carbonic acid, and then pouring it into the previously heated tube by a filler reaching to the bottom of it. Such care is only expended on the best instruments; ordinary weather-glasses, not needing to be quite accurate, are more simply filled. Notwithstanding all these precautions, minute bubbles of air manage to keep secreted, and creep up in the course of time into the Torricellian vacuum. To obviate this risk of error, an air-trap is recommended by which any air that may accidentally find its way into the tube is arrested in its ascent to the top, and the instrument sustains no damage from the accident.

Barometers are usually divided into two classes—cistern barometers, and siphon barometers. The simplest form of the cistern B. is that shown in fig. 1, which only

requires to be set properly in a frame, and provided with a scale, to make it complete. Fig. 2 presents another form of that class, being that generally seen in weather-glasses or ordinary barometers. The tube is bent at the bottom, and the cistern is merely an expansion of the lower end. Very generally, the cistern is hidden from view, and protected from injury by a wooden cover in front. There are two causes of inaccuracy in cistern barometers—one being the capillarity, which tends to lower the column, and the other being the difference of level in the cistern caused by the fluctuations in the tube, which renders the readings on the fixed scale above at one time too great, and at another too small, according as this level rises above or falls below the original level from which the scale was measured. The effect of capillarity may be avoided by using tubes of more than half an inch in bore, in which the depression becomes so small, that it may be left out of account; and in smaller tubes it may be estimated from tables constructed for the purpose. Wide tubes have the additional advantage, that atmospheric changes are seen earlier in them than in narrow tubes, there being less friction in the former than in the latter. It is worthy of notice that the capillary depression is less in boiled than in unboiled tubes, in consequence of the admixture of a minute quantity of the oxide of mercury, formed in the process of boiling, which lessens the repulsion between the mercury and glass. With reference to the error of level, it must be borne in mind that the height of the column sustained by the atmosphere is always to be reckoned from the lower level. This error becomes all the less the larger the capacity of the cistern is compared with that of the tube, for then a very considerable rise or fall in the tube, when spread over the surface of the cistern, makes only a slight difference of level in it. Care must be taken, then, in ordinary barometers, to make the cistern as large as possible. The only B. in which the error of level is completely obviated, is that invented by Fortin, which, from its being in every respect the most perfect cistern B., deserves particular notice. The cistern, and the lower portion of the tube of this B., is shown in fig. 3. The cistern is made of boxwood, with a movable leather bottom, *bb*, and a glass cylinder is inserted into it above, all except the glass being incased in brass. In the bottom of the brass box a screw works, on the upper end of which the leather rests, so that by the sending in or taking out of the screw, the bottom of the cistern, and with it the cistern level of the mercury, can be raised or depressed at will. A small ivory pin, *p*, ending in a fine point, is fixed to the upper frame of the cistern; and when an observation is made, the surface of the mercury is made to coincide with the point of the pin as the standard level from which the barometric column is to be measured. The tube of the B.—the upper part of which is shown in fig. 4—is inclosed in one of brass, which has two directly opposite slits in it for showing the height of the column, and on the sides of these the graduation is marked. A brass collar, *cc*, slides upon the tube with a vernier (q.v.), *vv*, marked on it for reading the height with the greatest exactness, and in which two oblong holes are cut, a little wider than the slits in the brass tube. When a reading is taken, the collar is so placed that the last streak of light is cut off by the two upper edges of the holes, or until they form a tangent to the convex mercurial curve. By this means, the observer is sure that his eye is on a level with the top of the column, and that the reading is taken exactly for this point. This is the contrivance usually



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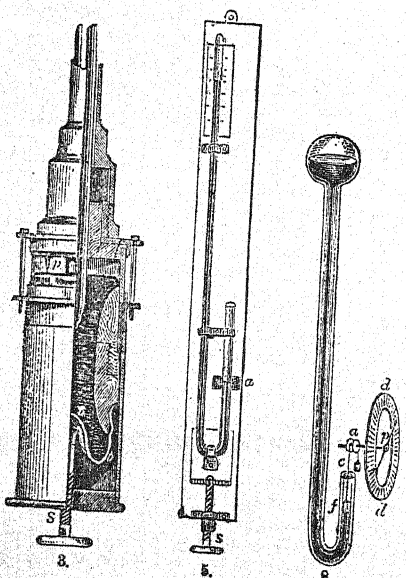


3. 5. 8.

adopted to prevent the error of parallax, or that caused by the eye being slightly above or below the top of the column, by which the scale and the top of the column are projected too high or too low, the one upon the other, as the case may be. The only other arrangement worthy of mention for effecting the same object is that by Weber, who etches the scale on a piece of silverized glass placed over one side of the tube; and when—the mirror and tube being vertical—the image of the eye appears along with the vertex of the column, the eye is in the same horizontal line with it. Fortin's B. is generally arranged so as to be portable, in which case the screw, *s*, is sent in until the mercury fills the whole cistern, by which the air is kept from entering the tube during transport, the leather yielding sufficiently at the same time to allow for expansion from increase of temperature. It packs in a case, which serves as a tripod when the instrument is mounted for use. On this tripod it is suspended about the middle, swinging upon two axes at right angles to each other, so that the cistern may act the part of a plummet in keeping the tube vertical—the position essential to all correct measurements.

The siphon B. consists of a tube bent in the form of a siphon, having the same diameter at the lower as at the upper end. Fig. 5 represents a simple form of it. The tube travels along the board on which it is placed by passing easily through fixed rings or collars of brass. A scale, divided in inches and parts of an inch, is fixed on the upper part of the board; and when an observation is taken, the tube is adjusted by the screw *s*, working below it, so that the top of the lower mercurial column may be on a level with the fixed mark, *a*, which is the point from which the fixed scale is measured. In the best forms of the siphon B., both tube and scale are fixed, the latter being graduated upwards and downwards from a zero-point near the middle of the tube, and the height of the column is ascertained by adding the distances from it of the upper and lower levels. The siphon B. is in many respects a more perfect instrument than the cistern barometer. In the first place, the bore at the upper and lower ends of the tube being the same, the depression arising from capillarity is alike for both, and the error from this cause disappears in taking the difference of the heights. In the second place, since the final reading is got from a reference to both upper and lower surfaces, the error in the cistern B. produced by the different capacities of the tube and cistern, is effectually avoided. On the other hand, the taking of two readings, one for each column, is a serious addition to the labor of observation. Gay-Lussac's siphon B. (fig. 6) is bent near the bottom, so as to allow of the lower branch being placed in the same straight line as the upper one—a position highly favorable to accurate observation. When constructed for transport, the tube at the bend is narrowed, as in the figure, to a capillary width, which effectually excludes the air; and when the tube is inverted (fig. 7), being the position in which it is carried, the mercury is nearly all held in the longer branch. Such a tube when mounted, like Fortin's B., makes an excellent traveling instrument, and is comparatively light, from the small quantity of mercury it contains. See ANEROID BAROMETER.

The wheel B., originally invented by Hook, and generally seen as a parlor ornament, has little to recommend it as a trustworthy instrument. Fig. 8 shows the main features of its construction. It is essentially an ordinary B. like the siphon B. below, but having a cistern above, to increase the amount of variation in the lower branch. A small piece of iron or glass, *f*, floats on the open surface, and a thread is attached to it, and passed over a small wheel, *a*, fixed to a horizontal axis, to which it is kept tight by a small weight, *c*, hanging at the other end. A pointer, *p*, is fixed to the other extremity of the horizontal axis, which moves to the right or left of the dial, *dd*, according as the mercury falls or rises in the lower branch. The great sweep which the index takes, as compared with the comparatively minute variations of the mercurial column, is the only merit of this instrument. It is easy to see, that with so much intervening between the mercury and the index, the chances of error from friction and other causes are very considerable.

The correction of the B. for temperature is of importance. Mercury expands $\frac{1}{9990}$ of its bulk for every degree of Fahrenheit's thermometer; consequently, a column of 30 in. at 32° F., or the freezing-point, would, at 65° F., for instance, be $\frac{9990+33}{9990}$ times 30 in., or nearly $\frac{1}{10}$ of an inch longer, for $30\frac{1}{10}$ in. of mercury at 60° produce the same pressure as 30 in. of it at 32°. In order, therefore, that all observations may be compared correctly with each other, the observed heights are reduced to what they would be at 32° F. as a standard temperature. The rule for reduction is very simple: Multiply the number of degrees above or below 32° F. by the observed height, divide the product by 9990, and subtract or add the quotient from or to the observed height for the reduced height. Tables for this purpose have been published by the royal society, from which the corrections are found at once.

The variations of the B. are found to be both periodical and irregular. Periodical variations are those taking place at stated and regular intervals, and irregular, such as have no regular period of recurrence. The only truly periodical variation is the daily one, which varies from 0.150 to 0.001 inch. In most regions of the globe there is also a well-marked annual variation, widely different for different regions. Accidental variations have a range of about 3 inches. See ATMOSPHERE.

The uses of the B. may be classified into physical, hypsometrical, and meteorological. It is of essential use in all physical researches where the mechanical, optical, acoustical, and chemical properties of air or other gases are dependent on the pressure of the atmosphere. Its use in hypsometry, or the art of measuring the heights of mountains, is very valuable. When a B. is at the foot of a mountain, the pressure it sustains is

greater than that which it experiences at the top by the weight of the column of air intervening between the top and bottom. A formula of considerable complexity is given by mathematicians for finding very nearly the true height of a mountain from barometrical and thermometrical observations made at its base and summit, the interpretation of which does not come within the compass of this work. The following rules give very nearly the same result: 1. Reduce the mercurial heights at both stations to 32° F. 2. Take the logarithms of the corrected heights, subtract them, and multiply the result by 10,000, to give the approximate height in fathoms of the upper above the lower station. 3. Take the mean of the temperature at both stations, take the difference between this mean and 32, multiply the difference by the approximate height, and divide the product by 435. This last result is to be added to the approximate height if the mean temperature is above 32, and subtracted, if below, to find the true height in fathoms. A Fortin's or Gay-Lussac's B. is employed in measuring heights.

The best known use of the B. is as a meteorological instrument, or as a weather-glass. Opticians have attached to certain heights of the B. certain states of weather, and at certain points of the scale the words "rain," "changeable," "fair," etc., are marked; but the connection thus instituted is very misleading. Those who have observed most carefully the connection of barometric heights with changes of the weather, discard entirely the use of these terms; and state that it is not the actual height of the B. at any place, but this height as compared with that of surrounding regions which indicates the coming weather. Several elaborate codes of rules have been drawn up to serve as a key to the variations, but as these are more or less of a local character, they would be out of place here. Generally speaking, a falling B. indicates rain, a rising B. fair weather. A steady B. foretells a continuance of the weather at the time; when low, this is generally broken or bad, and when high, fair. A sudden fall usually precedes a storm, the violence of which is in proportion to the barometric gradient. An unsteady B. shows an unsettled state of weather; gradual changes, the approach of some permanent condition of it. The variations must also be interpreted with reference to the prevailing winds, each different wind having some peculiar rules. The connection between changes of weather and the pressure of the atmosphere is by no means well understood. One reason is given, which may to some extent account for the B. being lower in wet than in dry weather—viz., since, as has been shown by Dalton, moist air is lighter than dry air, wherever a large amount of aqueous vapor has displaced a part of the drier air, the barometric column will read relatively low. Hence much depends on the nature of the winds. The s. and s.w. winds, which are, in western Europe, more than any other, the rain-bringing winds, are warm and moist winds. Now, a column of such air, to be of the same weight as one of cold dry air, must be higher; but this it cannot well be in the atmosphere, for no sooner does the warm moist column, by its lightness, rise above the surrounding level of the upper surface of the aërial ocean, than it flows over, and becomes nearly of the same height as the cold air around it. The interchange taking place less interruptedly, and consequently less slowly, in the higher strata than in those near the ground, it is some time before the equilibrium thus disturbed is restored, and meanwhile the B. keeps low under the pressure of a rarer atmospheric column. On the other hand, the northerly and easterly winds, being comparatively cold and dry, are accompanied with fair weather and a high barometer. It is thus to the warmth, as well as to the moisture of these winds that the low pressure is to be ascribed. Hence, then, the rain attendant on a low B., as well as the fine weather accompanying a high B., are the necessary concomitants of our geographical position—of our having the land to the e., and the ocean to the w. of us. In Great Britain a high and rising B. frequently accompanies e. winds with a drenching drizzle; and on the La Plata river, things are the reverse of what they are with us; there the cold s.e. wind, coming from the ocean, brings rain with a high barometer, and the land winds, warmed by the plains of South America, maintain fine weather with a low barometer. That the temperature, as well as the moisture of the air, is at least an important cause of the changes of the B., is also shown by the fact, that, in the tropics, where the variations of the temperature are slight compared with the temperate zones, the B. experiences almost no change. In central Asia, the summer pressure is nearly an inch less than that of winter, and at Deniliquin, towards the interior of Australia, it amounts to 0·250 inch.

BAROMETRIC LIGHT, a faint electric light produced in the vacuum of a mercurial barometer by swinging the instrument to and fro, causing friction of the mercury against the inside of the tube.

BAROMETZ, or Tartarian or Scythian lamb, the prostrate stem (rhizome) of a fern (*aspidium barometz*) which grows in the salt-plains near the Caspian sea. It is shaggy with a silky down, and has a sort of general resemblance to an animal. In the days of ignorant credulity, when the story of the phœnix was received as a truth of natural history, and barnacles were believed to grow into geese, and horses' hairs into eels, marvelous tales were told of the B., which was supposed to partake of the natures of a plant and an animal, to grow on a stalk, and eat grass like a lamb, etc. Erman (*Travels in Siberia*) supposes that the fables regarding the B. may have some connection with the cotton plant.

BARON. This term, as to the origin of which much difference of opinion exists, is probably derived from the Latin word *baro* (allied to *vir*, a man, a hero), which originally signified a stupid, brutal man, afterwards came to signify a man simply, and latterly, by one of those strange transmutations which are not uncommon in language, a man pre-eminently, or a person of distinction. Teutonic, Celtic, and even Hebrew derivations have also been assigned to the word; but the fact of its having been introduced into this country by the Normans, seems in favor of a Romanic origin. It is now the title which we apply to the lowest degree of hereditary nobility. The degree of B. forms a species of landing-place, corresponding amongst noblemen, in a certain sense, to that of gentleman, at a lower stage of the social pyramid. It was in this sense that the word was used in former times to include the whole nobility of England, because all noblemen were barons, whatever might be the higher ranks in the peerage which they occupied. The word peer has recently come to be used with the same signification, perhaps because it is no longer necessarily the case that every nobleman should be a B., there being instances in which earldoms and other honors have been given without a barony being attached to them, and in which the barony has been separated from the higher degree by following a different order of descent. The general theory of the constitution, however, still is, that it is as barons that all the peers sit in the upper house; and it is on this ground that the archbishops and bishops are said to sit in virtue of their baronies. The distinction into *greater* and *lesser* barons seems from an early period to have obtained in most of the countries of Europe. The greater barons, who were the king's chief tenants, held their lands directly, or *in capite*, as it was called, of the crown; whilst the lesser held of the greater by the tenure of military service. The greater barons, who corresponded to the *freiherren* (free lords) of Germany, had a perpetual summons to attend the great councils of the nation; whereas the latter were summoned only in case of their lands embracing a certain extent, which in England was thirteen knights' fees and a quarter. See KNIGHT'S FEE. When the representation of the middle class in England came to be confided to the knights of the shire and burgessess of towns, the minor barons ceased to receive the royal summons, and by degrees the title B. came to be applied to the greater barons, or lords of parliament, as they were called, exclusively. For an account of the barons of England immediately after the conquest, and of the lands which they held, see DOOMSDAY-BOOK. The habit of conferring the rank of B. by letters-patent, by which it was converted into a mere title of honor, apart from the possession of landed property or of territorial jurisdiction, was first introduced by king Richard II., who, in 1388, created John Beauchamp, of Holt castle, B. of Kiderminster. In Germany, the old barons of the empire were for the most part raised to the dignity of *grafs* (counts) and princes; whilst the lesser, in place of passing into the ranks of the untitled gentry, as in England, constituted a grade of the lower nobility, to which no duties were assigned, and scarcely any political privileges belonged.

When a B. is summoned to the house of lords by writ, a letter, in the sovereign's name, directs him to repair to the parliament, to be holden at a specified time and place, to advise with his sovereign, the prelates, and nobles, about the weighty affairs of the nation. On the arrival of the new peer, he is presented by two barons to the lord-chancellor, his patent or writ being carried by a king-at-arms. This having been read by the chancellor, he congratulates him on becoming a member of the house of peers, and invests him with his robe. The oaths are then administered by the clerk of parliament, and the new B. is conducted to a seat on the barons' bench. In addition to barons by writ and barons by patent, barons by prescription are usually mentioned, but incorrectly according to Blackstone, who remarks that "those who claim by prescription must suppose either a writ or patent made to their ancestors, though by length of time it is lost." (Kerr's ed., vol. i. p. 406.) There are some distinctions between a creation by writ and by patent which ought to be mentioned. "The creation by writ," says Blackstone, "is the more ancient way, but a man is not ennobled thereby, unless he actually takes his seat in the house of lords; and some are of opinion that there must be at least two writs of summons, and a sitting in two distinct parliaments, to evidence an hereditary barony." In consequence of the inconvenience thus attending it, the creation by writ may now be considered as obsolete, although the eldest son of a peer is still frequently called up to parliament by means of it, there being in that case no danger of the children losing their nobility even should their father never take his seat. But though creation by patent is thus in general the surest way of insuring the hereditary character of the peerage, it labors under one disadvantage as compared with a creation by writ—viz., that whereas in the latter case the dignity once insured by possession passes to the heirs of the holder without any words to that purpose, in the former there must be words to direct the inheritance, else the dignity endures only to the grantee for life. Where the patent, again, in place of being silent as to the succession, expressly sets forth that the dignity is for life merely, it was held, in the Wensleydale case, that it does not make the grantee a lord of parliament at all.

The coronation and parliamentary robes of a B. differ very slightly from those of an earl. The right of wearing a coronet was conferred on barons for the first time by king Charles II.; their head-dress till then having consisted of a cap of crimson velvet, lined with ermine, and having a plain gold band. A baron's coronet is adorned with six

pearls, set at equal distances on the chaplet. Coronets are worn only on great occasions of state ceremonial. In ordinary garb, there is nothing to distinguish a B. from a commoner. A B. has the title of "right honorable lord," etc., and is addressed as "my lord," or "your lordship." His wife has also the title of "right honorable," and is addressed as "madam," or "your ladyship." A B., in signing, sinks his Christian and family surname, and subscribes his titular designation. His children enjoy the prefix of honorable, as the "honorable"—mentioning Christian and surname. In literature and conversation, a deceased B. is referred to by his Christian name, according to his number in the list of peers of the same title, as "Henry, eighth baron."—The barons of exchequer (q.v.) and of the cinque ports (q.v.) are examples still existing of the ancient barons by office.

In the united kingdom, there are persons who possess the title of B. imparted by some foreign power; as, for example, "baron Rothschild." No such honor can be legally enjoyed without the consent of the sovereign; but at best the title is only honorary, and communicates no special privileges. A good article on the baronage will be found in the *Cyclopædia of Political Knowledge*, published by Bohn, London, 1853. See PEER.

BARON, BERNARD, 1700–62; a French engraver of merit, who lived several years in England, where he died. He engraved for Crozat's collection of prints.

BARON AND FEME, or FEMME. These are two Norman-French words used in English law-books to denominate HUSBAND AND WIFE (q.v.); and see MARRIAGE.

BARON AND FEMME, in heraldry, is the expression used to designate the bearing by which the arms of husband and wife are carried per pale or marshalled side by side on the same shield. The husband's arms are always carried on the dexter side. Where the wife is an heiress—i.e., the representative of her father's house—her husband carries her arms, not *per pale*, but in a shield of pretence; and they are quartered with the paternal coat by the issue of the marriage.

BARON, or BAYRON, MICHAEL, 1653–1729; a French actor, instructed by Moliere. He was also a writer of plays. As an actor he was excellent in tragedy and in comedy, but he was inordinately vain of his personal appearance, and very frequently connected with the scandals of the time. He was stricken with apoplexy while on the stage, and died two weeks afterwards.

BARONET. This title, which is the diminutive of baron, is the lowest degree of hereditary honor in the united kingdom. Baronets were instituted, for the first time, by king James I., on the 22d May, 1611. The ostensible object was to promote the plantation of Ulster, in Ireland, with English and Scottish settlers; but the real aim was to raise money. Each B. was bound to maintain 30 soldiers in Ireland for 3 years, at the rate of 8*d.* per diem for each man; the wages of one whole year to be paid into the exchequer on the passing of the patent. The sum thus exacted, with the fees of honor due to the officers, amounted to upwards of £1000 on each patent. It is a striking proof of the passion for hereditary distinction, that 200 persons were willing to accept the honor on such terms. It was part of the bargain that no title should be created between a B. and a baron, and that the number of the former should be permitted to diminish as the families of the original 200 died out, thus enhancing the value of the title to those that remained. But the latter stipulation was very speedily departed from, and a new commission was appointed to fill up the vacant places, and even to treat with new applicants. Such was the origin of English baronets. From the date of the union, in 1707, those created in England and Scotland were baronets of Great Britain. Irish baronets were created until 1800, since which period all baronetcies are of the united kingdom. There is no limit to the creation of baronets but the will of the sovereign. At investiture there is no ceremony. The rank is communicated by patent or writ, issued under authority of the crown; the fees of office being considerable. There are differences in the terms on which the honor descends (suggested, perhaps, by the recipient according to family circumstances). Sometimes, according to the patent, the rank is confined to direct heirs-male; sometimes it embraces heirs-male collateral; and sometimes, in default of direct male heirs, it passes to the husbands of heirs-female. For the style and privileges of baronets, in matters of ceremony, see Burke's *Peerage and Baronetage*. Baronets have precedence of all knights, except those of the garter, bannerets made under the royal banner in open war, and privy-councilors. They are entitled to have *sir* prefixed to their name, along with B. as an affix. The wife of a B. is legally styled *dame;* but in common speech she is called lady, and addressed as "your ladyship." The rank of B. does not raise a person above the degree of commoner; but many baronetcies have, in course of time, been heritably acquired by peers, which lessens the ostensible number.

Baronets of Scotland and Nova Scotia originated in a project of James I.; but were not instituted till 1625, by Charles I. The professed object was to encourage the settlement of Nova Scotia in North America; and a grant of a certain portion of land in that province, to be held of sir William Alexander, afterwards earl of Stirling, who was then his majesty's lieutenant in Nova Scotia, actually accompanied the title—the grants of land being of course illusory, for their very designations were a fiction. The first person who received the honor of a Nova Scotian baronetcy was Robert Gordon of Gordonstone.

a younger son of the earl of Sutherland, whose patent bears date May 28, 1625. There are no new additions to this branch of the baronetage; the latest creation having been in 1707, the year of the union of Scotland and England. In point of title and popular recognition, there is no distinction between these and other baronets.

BARO'NIUS, CÆSAR, an eminent Roman Catholic ecclesiastical historian, b. at Sora, in Naples, on the 30th Oct., 1538, and educated at Naples and Rome. He was one of the first pupils of St. Philip Neri, who founded the congregation of the Oratory, of which B. became superior in 1593. He soon after became father confessor to the pope, apostolical prothonotary, and finally, in 1596, cardinal, and librarian of the vatican library. On the death of Clement VIII., in 1605, 30 voted in conclave for the election of B. as pope; and but for the opposition of the Spaniards, who were indignant at him for his treatise *De Monarchia Siciliæ*, in which he argued against Spain's claim to that country, he might have been elected. The controversy against the work called the *Magdeburg Centuries* (q.v.), which had already been weakly attempted by Muzio in 1570, seemed at that time the most important undertaking for the learning of the church of Rome. B. entered upon this controversy with great energy and in a position most favorable for access to authorities, composing his *Annales Ecclesiastici a Christo nato ad ann.* 1198 (12 vols., Rome, 1588–1607), in which work he labored till his death, 30th May, 1607. As his object was to prove that the church of Rome has not departed in doctrine or constitution from the Christian church of the 1st c., B. has been accused of not using his authorities according to their proper historical sense, but artfully concealing, obscuring, and falsifying many things—sometimes, perhaps, from ignorance of the Greek, but more frequently with design. His *Annals* have been frequently reprinted, but the reprints are often incorrect and incomplete. The most recent, provided with copious notes, etc., and containing Pagi's *Critical Examination* and Rinaldi's continuation, although not yet entirely correct, is the edition of Mansi (43 vols. 1738–57). The *Critica in Annales Ecclesiasticos Baronii* of Anthony Pagi, the Franciscan (4 vols., Antwerp, 1705, improved by Francis Pagi, Antwerp, 1724), corrects B. in many points, especially of chronology. Among the continuation of the *Annals*, all of which are inferior in value to the work itself, the most rich in matter are that of Bzovius, extending to 1572 (9 vols., Rome, 1616–72), and that of Rinaldi (10 vols., Rome, 1646–77), who availed himself of the materials left by B., for the period from 1198 to 1571. Amongst the other works of B., his publication of the *Martyrologium Romanum* deserves to be noticed (Rome, 1586, and repeatedly).

BARON OF BEEF, a large piece of beef, consisting of both sides of the back, or a double sirloin, and weighing, according to the size of the animal, from 50 to 100 lbs. This monstrously large piece of beef, roasted, is served only on particular festive occasions at the English court, and at great public entertainments. When served according to ancient custom at civic feasts in Guildhall, London, the B. is honored with a distinguished place on a kind of elevated rostrum, where it is ceremoniously carved for the assembled guests. The term B. probably originated in a fanciful allusion to the word sirloin; inasmuch as a *baron* is superior in rank to a *sir*.

BARONS OF THE EXCHEQUER. See EXCHEQUER, COURT OF; COMMON LAW; COMMON LAW, COURTS OF; REVENUE.

BARONY is, or, it may rather be said, was a manorial and hereditary right arising out of land, known to the law both of England and Scotland. In England, manors were formerly called baronies. In the Scotch law, a right of B. is a right in relation to lands which have been erected, or at least confirmed by a clause in crown charters making the grant *in liberam baroniam*, as it is called; and by the crown alone could such a right be conferred. It involved a civil and criminal jurisdiction to which, in theory, all the inhabitants of the B. lands were amenable. But such jurisdiction has, by modern legislation, been so limited and obstructed as scarcely ever to be exercised; and, indeed, in regard to the right of B. itself, the clause in crown-charters erecting baronies has, since the abolition of heritable jurisdictions by the 20th Geo. II. c. 43, become obsolete. But by the 35 Geo. III. c. 122, they are permitted on the sea-coast for encouragement of fisheries, and the bailies thereof (see BAILIE) are to have the powers of justices of the peace. In England, the lord or baron of the manor may hold his COURT BARON (q.v.; see also MANOR, JURISDICTION).

BAROS'MA. See BUCKU.

BAROTSE, a valley in s. Africa, 15° 20′ to 16° 30′ s., and 23° to 24° e., traversed by the Zambesi river, and subject to its inundations. The natives build their villages on natural or artificial mounds to escape this overflow. The Barotses reverence the sun, pray to the alligator, which animal abounds in the river, and believe in some future existence. Their chief town is Narile. The soil of this valley is fertile, and will produce two crops in a year, but not much of it is cultivated.

BARQUE, or BARK, is a name frequently given to ships, but with no very definite meaning. Sometimes it denotes a ship of small size; sometimes a broad-sterned vessel without a figure-head; but more technically it applies to three-masted vessels whose mizzen-sails are fore-and-aft instead of being square. An *armed* B. is one variety of a special sort of vessel noticed in another article. See ARMED SHIP.

BARQUESIME'TO, a city of Venezuela, the capital of a province of the same name, situated on an affluent of the Portuguesa, in a high plain, 156 m. w.s.w. from Caraccas. B. was founded by the Spaniards in 1552; and in the beginning of the 19th c. was a flourishing town, with straight wide streets and some fine buildings, the pop. about 15,000; but in 1802 it was almost totally destroyed by an earthquake. The existing town has been mostly built from the ruins. The pop. is supposed to be about 12,000.—The province of B. extends along the coast of the Caribbean sea, contains an area of 9305 sq.m., and a pop. of about 313,000. Wheat, maize, coffee, cacao, indigo, and cattle are its principal products.

BARR, a t. in Alsace, at the foot of the Vosges, 18 m. s.w. of Strassburg; pop. '71, 5651. In 1592 it was destroyed by the cardinal of Lorraine. Near the t. is Mt. Odilia, on which a daughter (canonized as St. Odilia) of duke Attic of Alsace, established a monastery. The building was sold during the revolution of 1789.

BARR, or BARRA, a petty Mandingo kingdom of western Africa, at the mouth of the Gambia, with an estimated area of about 250 sq. leagues, and a pop. of 200,000, the males being remarkable for their fine proportions. The surface, which is fertile, but rather marshy, is well cultivated.

BARRA, a pleasant suburban t. about 3 m. e. of Naples, with a pop. of 9000. It has numerous fine country residences.

BAR'RA, a small island near the s. extremity of the Hebrides, Scotland, belonging to Inverness-shire, and 42 m. w. of Ardnamurchan point; lat. of Barra-head, 56° 48′ n., long. 7° 38′ w. It is 8 m. long, and 2 to 4 broad, with deep inlets of the sea. A low sandy isthmus, over which the sea nearly breaks at high water, connects the two parts into which B. is divided. The s. or larger part contains a rocky mountain, 2000 ft. high, and is divided into small valleys. The island is formed of gneiss. The soil is sandy, but sheep and cattle are fed on the hill and meadow pastures. Pop. '71, 1563, chiefly Roman Catholics, speaking Gaelic with great purity; and among the most industrious of Scottish fishermen. Their boats are sharp fore and aft, and are built by the fishermen themselves, who engage extensively in the cod, ling, herring, and shell-fish fisheries. Two hundred horse-loads of shell-fish (cockles, limpets, mussels, razor-fish, lobsters, crabs) have been taken off the sands in one day during the summer spring-tides. The lighthouse on Barrahead, the loftiest in Britain, is 680 ft. above the sea, and is seen 33 m. off.—The parish includes several smaller islands, the total pop. of the group in 1871 being 1753.

BARRACKPORE', a native t. and military cantonment on the e. bank of the Hoogly, and 16 m. up the stream from Calcutta. Pop. '72, 9591. From the salubrity of its air, B. is a favorite retreat for Europeans from Calcutta, the governor-general having here his country residence. In fact, B. appears to have long enjoyed this kind of distinction; Mr. Job Charnock, the founder of Calcutta, having erected a bungalow here as far back as 1689. In 1857, B. became famous as the cradle of the formidable mutiny or rebellion of that year. Several regiments of native troops were stationed at B. The men objected to bite off the ends of the cartridges for the Enfield rifle, believing the paper to be polluted by animal fat. The troubles connected herewith—a mere prelude to the fatal outbreak at Meerut in May—commenced about the beginning of February, and continued to assume various degrees of intensity, till at last two regiments of Bengal native infantry had to be disbanded—the 19th, on 31st Mar.; and the 34th, on 5th May. It was in the last-named corps that the first blood would appear to have been drawn, an intoxicated sepoy having attacked and wounded his officer, lieut. Baugh, with sword and pistol. This fellow, whose name was Mungal Pandy, would seem to have had the equivocal honor of giving the local designation of Pandies to the entire body of insurgents.

BARRACKS are permanent structures for the accommodation of soldiers, as distinguished from huts and tents. Originally, the word, derived from the Spanish *barracas*, applied to small cabins or huts; but in England, the term is now always considered to relate to structures of brick or stone. Great opposition was made in this country to the introduction of permanent B. during the early part of the last century, on the ground that the liberty of the subject might possibly be endangered by thus separating the soldiery so completely from the citizens, and placing them in the hands of the ruling power. On the other hand, it was contended that the older system of billeting the soldiers on the people is vexatious and burdensome; and that the morals of towns-people and villagers are liable to be vitiated by the constant presence of soldiers. The permanent B. were few in number down to the year 1792, when George III. obtained the consent of parliament for the construction of several new ones, and for the founding of the office of barrack-master-general. Various changes in the arrangements were made from time to time. The expenditure for B., in building, rebuilding, enlarging and repairing, between 1793 and 1804, was £4,100,000; between 1804 and 1819, £3,220,000; and between 1819 and 1859 (including Aldershott B.), upwards of £7,000,000. It was found that in 17 B., constructed between 1832 and 1857, the cost varied from £27 to £209 per soldier accommodated, according to the inclusion or exclusion of officers' quarters, etc. The funds provided for the construction and maintenance of B. in 1879–80 was £436,850.

The condition of British soldiers has, ever since the disasters in the Crimea in the winter of 1854, been an object of much public solicitude. This solicitude was so strongly expressed as to break through the cold formalities of the official departments. Returns were ordered, and commissions and committees appointed, partly to inquire into existing facts, partly to suggest improvements. The barrack-master-general was replaced at the beginning of this century by commissioners for barracks, whose functions were absorbed by the now extinct board of ordnance in 1822. Barracks are now under the supervision of the surveyor general of the ordnance, who provides for their construction and maintenance through the royal engineers; and for their victualling and daily service through commissaries of the control department. Under these commissaries are barrack-clerks and barrack-sergeants, to assist them in the duties. The furniture of the B. is bought by the war office. The French have a singular plan of *hiring* such furniture at 15 fr. per man per annum; the English cost is about 25*s.* per man, and some of our officers are of opinion that it might with advantage be superseded by the French plan. The barrack-rooms have arm and accouterment racks, shelves, and pegs; with a regular order for depositing everything thereon. During the day, all the bedding is placed in exact array; as well as dishes, tins, and canteens. A subaltern officer visits every room every day. The iron bedsteads are turned down every evening, and up every morning. One non-commissioned officer (sergeant or corporal) has control over each room, and is responsible for quiet, cleanliness, etc. Married women, in the ratio of 6 to a company of 100 soldiers, may live in the B. with their husbands, in separate rooms known as "married soldiers' quarters," but not unless the marriage has been with consent of the commanding officer. The married soldier may, however, sleep out of B., and is allowed an extra 2*d.* per day if he does so. Each soldier in a barrack has an iron bedstead, a rug, a paillasse, a bolster, two blankets, and two sheets; he pays nothing for these. Each soldier has his name and number written near his bed and knapsack.

Notwithstanding the order and regularity established in B., committees of inquiry appointed in 1855 and 1857 ascertained the existence of grievous defects. It was found that, out of 252 B., only 20 had separate sleeping-rooms for married soldiers; the wives of such soldiers, in the other 232, being obliged to put up with arrangements repugnant to all decency and propriety, or else sleep away from the B. altogether.

In regard to sanitary arrangements, great efforts have been made at vast cost in recent years to improve all the hygienic conditions, such as drains, ventilation, means of ablution, recreation, circulation of air, etc. The result has been very apparent in the reduced rate of mortality. Army-physicians recommend 600 cubic ft. of room space per soldier; and this is the standard now demanded in all practicable cases by the war office. It has been estimated that a new barrack for 1000 footguards in London would cost £150,000, *besides land*, the cost of which would depend wholly on the particular site selected. The necessity for grounds for exercises, stores, surgery, offices, etc., renders a barrack a very costly congeries of buildings. Twenty acres may be taken as the minimum space needed for 1000 men. In relation to all the various subjects of barrack-life, a committee of military officers has drawn up a most comprehensive scheme of reform; but unfortunately the cost of making these improvements would be so enormous, that nothing better than a very gradual adoption can be expected.

The finest existing B. in this country are perhaps those at Aldershott, attached to the camp noticed in another article. See ALDERSHOTT CAMP. The buildings extend in two long lines, branching out of the Farnborough and Farnham road, with a large parade-ground between them. The infantry and artillery B. are on the n. side of this space, and the cavalry B. on the south. The infantry B. are divided into blocks, forming each a spacious quadrangle, with a court yard in the center. Each block is a complete barrack for a full regiment, with all the men's rooms, store-rooms, school-rooms, offices, etc. The officers' rooms are, however, separate, and occupy open spaces between the blocks of buildings. All the four sides of each quadrangle are occupied by various rooms and buildings; the men's living and sleeping rooms being mostly on the side next to the parade-ground. The sleeping-rooms, each for 24 men, are very large and airy; the washing-rooms are ample and well-fitted; and the cooking-rooms will each cook for 350 men. Dry play-grounds and drill-yards under glass roofs are provided. A broad balcony outside every range of sleeping-rooms enables the soldiers to look out upon these grounds. The married soldiers and their wives are comfortably provided for, in rooms wholly apart from the rest. The artillery and cavalry B. resemble in their general features those for the infantry.

By the military forces localization act of 1872, £3,500,000 is to be raised and expended in building and adapting B. for the 70 sub-district brigades among which the infantry is now divided.

BARRACKS (*ante*). The "Regulations" of the U. S. army prescribe 225 to 226 sq. ft. of space for every six soldiers, with height of 12 ft., giving each one 450 to 512 cubic feet. There are few masonry-built B. in the United States. Most of them are of logs or lighter timber. Of the more permanent are Madison B., at Sackett's Harbor, N. Y.; Citadel, at Charleston; Pensacola, at Pensacola; Jackson, at New Orleans; Jefferson (now an arsenal), at St. Louis; Baton Rouge arsenal, La.; Mt. Vernon arsenal, Miss.; Oglethorp, at Savannah; Benicia, in California; Carlisle, in Penn.; Ft. Leavenworth,

at Omaha; Newport, in Kentucky; San Francisco; Ringgold and Fort Brown, in Texas. There are B. for marines at the various navy yards.

BARRACOON, the appellation given to a depot for newly captured slaves on the coast of Africa, and where they remain under restraint until carried off by vessels in the slave-trade.

BARRA'DA, or BURADA, a river of Syria, which rising in lat. 33° 50′ n., long. 36° e., flows in a s.s.e. direction towards Damascus, above which it divides, one branch being diverted to irrigate the city and its gardens, while the other passes on the n. side. The branches, which it is supposed were the *Pharpar* and *Abana* of scripture, afterwards unite, and flow into the marshes and lake of Bahr-el-Merj.

BARRAFRAN'CA, a t. of Sicily, in the province of Caltanisetta, about 10 m. s.e. of the t. of Caltanisetta, with a pop. of about 9000.

BARRA MANSA, a t. of Brazil, in the province of Rio de Janeiro, and 70 m. n.w. of the city of that name. It is situated on the right bank of the Parahiba. Pop. 6000.

BARRAS, PAUL-JEAN-FRANÇOIS-NICOLAS, Count de, a distinguished character of the French revolution, was b. at Foy, in Provence, 30th June, 1755. In his youth he served as a lieutenant against the British in India, and after his return home, wasted his property in Paris in dissipation. He eagerly joined the revolutionary party, and was a deputy of the *Tiers Etat* in the states-general in 1789. He was actively concerned in the storming of the Tuileries, was appointed administrator of the department of Var, and afterwards of the county of Nice. In the convention, he voted for the execution of the king without delay or appeal, and on the 31st May, 1793, declared against the Girondists. The siege of Toulon, and triumph of the revolutionary party in the s. of France, were in a great measure owing to his activity and energy; and after the victory, he was deeply concerned in all the bloody measures which were adopted. Yet he was hated by Robespierre and the Terrorists, as one of the less decided revolutionists; and their overthrow was accomplished mainly by him, the convention appointing him commander-in-chief, and virtually investing him with the directorship for the time. While holding this high office, in which he acted with great decision and vigor, and on the same day on which Robespierre fell, he paid a visit to the Temple, and provided for the better treatment of the king's son; he hastened also to the Palais de Justice, and suspended the execution of a large number of persons who had been condemned to death. On subsequent occasions, he acted with decision both against the intrigues of the Royalists and the excesses of the Jacobins; and on 13th Vendémiaire (5th Oct., 1795), being again appointed commander-in-chief by the convention, he called his young friend Bonaparte to his aid, and crushed the sections with merciless discharges of artillery. The directory being appointed in Nov., 1795, B. was nominated one of the five members, and in this capacity he procured the nomination of Bonaparte as commander-in-chief of the army in Italy. It was he who arranged the marriage of Bonaparte with the widow Beauharnais. On 18th Fructidor (see FRUCTIDOR, and FRANCE), he was again invested with the dictatorship, and was again victorious. His authority now became preponderant in the directory, and he affected the pomp of a king, and began to give splendid entertainments in the palace of the Luxembourg. This continued for about two years, till the decline of the power of the directory. After 30th Prairial, Sièyes and he had the whole executive power in their hands; and whilst B. secretly negotiated, it is said, with the Bourbon princes, demanding a large reward for their restoration, Sièyes, in secret understanding with Bonaparte, brought about the revolution of 18th Brumaire. Notwithstanding the favors he had formerly conferred on Bonaparte, he was now, perhaps unavoidably, an object of suspicion to him, was compelled to remove from the neighborhood of Paris, resided in Brussels, then in Marseilles, was banished to Rome, and thence sent to Montpellier, being kept under constant surveillance of the police, and actually found to have been engaged in conspiracies for the restoration of the Bourbons. After the restoration, he returned to Paris, and purchased an estate in the neighborhood of it, where he died on 29th Jan., 1829. He had acquired a considerable fortune in the revolution. His memoirs, which must be of historic importance, were seized by the government.

BARRATRY, COMMON, or, as it is called in old English law-books, *barretry*, is the offense of inciting and stirring up suits and quarrels among the queen's subjects. *One* offensive act of the kind is not sufficient in order to maintain an indictment for this offense; but it must be shown that the party accused *frequently*, or at least on more than *one* occasion, conducted himself in the way imputed; and therefore the principle of the law appears to strike at the *habit* or *disposition* of evil-minded persons, who would incite to quarreling, or busybodies, as they are in fact called in old law-reports; who to use a familiar expression, "set people by the ears." This term is supposed by some to be derived from the French word *barrateur*, which signifies a deceiver; by others, from the Latin word *barratro*, a vile knave. Some, again, account for it by the suggestion that it is made up of *barra*, the bars of courts of justice, and *rettum*, an old word signifying an offense; while, by other antiquarian lawyers it is supposed to have been borrowed from the Normans; the Anglo-Norman *baret* signifying a quarrel or contention. In old English indictments, charging this offense, the accused is not only described as

pacis domini regis perturbator, but also *oppressor vicinorum suorum;* that is, he who is guilty of B., is not only a disturber of the public peace, but a nuisance to his neighbors. The punishment for this offense is fine and imprisonment; but if the offender belongs to the profession of the law, as is too frequently the case, he may besides be disabled from practicing his profession for the future. And, indeed, it is the existing statute law of England, that if any one who has been convicted of B. shall practice as an attorney, solicitor, or agent in any suit, the court, upon complaint, shall examine the matter in a summary way; and if the fact of such conviction be proved, may direct such offending attorney, solicitor, or agent to be kept in penal servitude for not more than seven or less than three years.

Akin to this offense is another of equal malignity and mischief; namely, that of suing another in the name of a fictitious plaintiff. If committed in any of the superior courts, this offense is treated as a high contempt, punishable at discretion, and in inferior courts, by six months' imprisonment, and treble damages to the party injured.

B., in the sense above explained, is not a technical term in the law of Scotland. But in that system there is a word *baratry*, which is defined as the crime committed by a judge who is induced by a bribe to pronounce a judgment, or who barters justice for money.

There is also *baratry of mariners*, which signifies—in the law not only of England and Scotland, but also of France and other European states—the fraud of the master or mariners of a ship tending to their own advantage, but to the prejudice of the owners. Such conduct, however, is one of those risks which are usually insured against in marine policies of insurance. See INSURANCE.

BAR'RE, a t. in Massachusetts, on the Ware river, 21 m. n.w. of Worcester; pop. '80, 2,418. B. is a town of farms and dairies, and has important manufactures, but is notable chiefly for an institution which has been very successful in the training of feeble-minded children.

BARRÉ, ISAAC, b. Dublin, 1726–1802. He was in Wolfe's army as lieut.col., was wounded in the capture of Quebec, and was with Wolfe when he died. In 1761, he was chosen to parliament, where he attracted attention by a violent personal attack upon Pitt, who led the opposition to Bute's administration. In 1765, he opposed the stamp act, supported the appeal of the colonies, and continued friendly to the Americans throughout North's administration. B. held various offices of importance, and was in parliament until 1790, when he retired in consequence of loss of sight. The authorship of the *Junius* letters has been attributed to him, but is not known.

BARRÉGES. See BARÉGES, *ante.*

BARREL (It. *barile;* Fr. *baril* = *barrique*), primarily, a large vessel for holding liquids =probably from *bar*, in the sense of to guard, confine, contain—and then a certain *measure*, but varying in every locality, and almost for every liquid. In the old English measures, the barrel contained 31½ gallons of wine, 32 of ale, and 36 of beer—the wine gallon itself differing from that of ale and beer. In imperial gallons, their contents would be: old wine barrel = 26½ gall.; ale do., 31½; beer, 36½. The Italian barile varies from 7 to 31 English gallons; the French barrique of Bordeaux = 228 French litres = 50 English gallons. Four barriques make a tonneau. In many cases, B. signifies a certain *weight* or other quantity of goods usually sold in casks called barrels. In America, flour and beef are sold on the large scale in barrels: a B. of flour must contain 196 lbs.; of beef, 200 lbs. A B. of butter = 224 lbs.; of soft soap, 256 lbs.; of tar, 26¼ gallons.

BARREL, GUN. The relation which the barrels of small-arms bear to the stock, lock, and other parts, is described in such articles as MUSKET, PISTOL, RIFLE, REVOLVER, BREECH-LOADING ARMS, etc.; but the remarkable processes of manufacturing these barrels may be briefly noticed once for all.

The iron for all good musket-barrels contains a portion of steel, or undergoes some kind of steeling process. Horseshoe nails or stubs, after much violent usage, yield a very tough kind of iron when re-heated; and English gun-makers have been accustomed to buy such refuse on the continent; but the foreign makers now use the old nails themselves; and Birmingham has to rely mostly on various home supplies of old tough iron. The best barrels are now made in England of laminated, twisted, and Damascus steel. To prepare *laminated steel*, Mr. Greener, a celebrated Birmingham gunsmith, collects scraps of saws, steel-pens, files, springs, and steel-tools, from the various workshops; cuts them into small and nearly equal pieces; cleans and polishes them by revolving in a cylinder; fuses them into a semi-fluid state; gathers them into a "bloom" or mass; forges this bloom with a three-ton hammer; hardens and solidifies it with a tilt-hammer; rolls it into rods; cuts each rod into pieces 6 in. long; welds these pieces together; repeats the rolling, cutting, and welding, several times; and thus finally brings the metal into a very hard, tough, fibrous, and uniform state. *Twisted steel* for barrels is made by taking thin plates of iron and steel, laying them alternately one on another in a pile, welding them by heat and hammering, and twisting them by very powerful mechanical agency, until there are twelve or fourteen complete turns to an inch; the length becomes reduced one half, and the thickness doubled by this twisting. *Damascus steel* barrels are made of steel which has undergone a still further series of welding and twisting opera-

tions. *Stub Damascus* barrels are made of a mixture of old files with old horse-nails; the files are heated, cooled in water, broken with hammers, and pounded in a mortar into small fragments; three parts of these fragments are mixed with five of stub; and the mixture is fused, forged, rolled, and twisted. An inferior kind of Damascus-twist is made by interlaying scraps of sheet-iron with charcoal, and producing an appearance of twist, but without the proper qualities. *Threepenny-skelp* and *twopenny-skelp* are inferior kinds of barrel-iron; and the worst of all is *sham-dam skelp*, of which gun-barrels are made for hawking at a cheap price at country-fairs, and for barter with the natives in Africa and the backwoods and prairies of America.

The gun-barrel manufacture of England is now almost wholly conducted at Birmingham and at Enfield, very few barrels being made elsewhere. The best barrels are all twisted into form. The skelps, or long strips of prepared steel, are twisted into a close spiral a few inches long; several of these spirals are welded end to end; and the fissures are closed up by heating and hammering. The rough barrel, with a core or mandril temporarily thrust in it, is placed in a groove, and hammered cold until the metal becomes very dense, close, strong, and elastic. The interior is then bored truly cylindrical by a nicely-adjusted rotating cutting-tool. If, on narrow inspection, the interior is found to be straight and regular, the exterior is then ground on a rapidly revolving stone, and finally turned in a lathe. Commoner barrels are not twisted: the skelps are heated, laid in a semi-cylindrical groove, hammered till they assume the form of that groove, placed two and two together, and heated and hammered until one B. is made from the two halves. See PROOF OF FIRE-ARMS; and RIFLED ARMS.

Common barrels are browned externally with some kind of chemical stain; but the best are rubbed with fine files, and polished with steel burnishers.

BARREL-BULK, a term denoting a measurement of 5 cubic ft., used chiefly in the coasting-trade.

BARREL-MAKING MACHINERY. The saw for cutting staves is a cylindrical sheet, having teeth upon one end; the blocks of wood are clamped in the usual manner, and the staves fall within the cylinder. They are then laid upon an endless conveyer, which carries them against two circular saws that cut them a definite length. Each piece is then placed in a pair of clamps, and moved against a rotary wheel provided with cutters, that dress the edge to the required bilge and bevel; the *bilge* is the increased width midway between the ends, which causes the enlarged diameter of the cask at the middle; the *bevel* is the angle given to the edge conforming to the radius of the cask. The surface of the stave is smoothed by passing it under revolving cutters; a late form of machine takes off the surplus wood from riven staves without cutting across the grain, following winding or crooked pieces as they are split from the block. The heads are usually made of several flat pieces jointed and fastened with dowels, or pins of wood. The edge of each piece is pushed against the side of a rotary disk, provided with cutters that instantly straighten it; it is then pushed against bits that bore holes for the pins to be afterwards inserted by hand. Several boards being pinned together, enough to make a head, the whole is first smoothed on one side and dressed to a uniform thickness; then it is clamped between two disks, and as these disks turn, a saw trims the head into a circle with a beveled edge; if the wood is green, an oval form may be given to provide against shrinking.

The barrel has next to be "set up." A sufficient number of staves are set into a frame, their edges refitted if necessary; stout iron hoops, called "truss hoops," pushed up from below grasp the lower ends tightly, and the whole may be lifted from the mold. One end of the barrel is formed, but the other is open and flaring. A rope is passed about the open end and taken to a windlass, and the staves are drawn together by tightening the rope; in this stage the barrel is heated to cause the staves to yield more easily to their required form. The barrel is now leveled by placing it upon a horizontal bed and bringing down upon it a powerful disk that presses upon its ends and forces the staves into their proper position. A machine is devised which trusses and levels the barrel at a single movement. The slack barrel stands in its truss hoops, two on each end; those of the lower end rest on strong supports; those of the upper end are seized by hooks whose handles pass down through the platform to a common lever; when all the parts are in place, powerful machinery pulls the upper trusses down, at once driving the barrel into the lower trusses, drawing together both ends, and leveling the whole. Each end of the shell, thus made, passes under a rotary cutter which forms a *croze*, or groove, to receive the head, and chamfers, or bevels, the ends of the staves. The heads are put in, and the hoops set by hand. The barrel is then made to turn under a smoothing tool and rapidly finished.

BARREL-ORGAN, an organ (q.v.) in which the music is produced by a barrel or cylinder, set with pins and staples, which, when driven round by the hand, opens the valves for admitting the wind to the pipes according to the notes of the music. The number of tunes that any one instrument can play is, of course, very limited. Barrel-organs are generally portable, and mostly used by street-musicians. A street-organ costs from £30 to £70, according to size. The most perfect barrel-organs are those which are driven by a motive-power, of which the best are made in Vienna, and cost from £100 to

£300. The orchestrion, made by Kaufmann in Dresden, is a large self-acting barrel-organ.

BARREN, a co. in s. Kentucky; 500 sq.m.; pop. '80, 22,321—4,940 colored; the soil is fertile, producing cereals and tobacco. Co. seat, Glasgow. The name comes from "barrens," applied to large tracts that are sparsely timbered.

BARRETT, BENJAMIN FISK, b. Me., 1808; a graduate of Bowdoin, and of Cambridge divinity school; pastor of the First New church (Swedenborgian) of New York, 1840–48, and in Cincinnati, 1848–50; subsequently over a Philadelphia society. His works are *Life of Swedenborg, Lectures on the New Dispensation, Letters on the Divine Trinity, The Golden Reed, A New View of Hell*, etc.

BARRHEAD, a t. of recent growth, in the e. part of Renfrewshire, 6 m. s.w. of Glasgow. It has cotton-mills, and bleaching and print works. Pop. '71, 6209.

BARRI, GIRALDE. See GIRALDUS CAMBRENSIS, *ante*.

BARRICADES are defense-works employed both in the military and naval services. Military engineers, and sappers and miners, are instructed in the art of barricading streets and roads with beams, chains, *chevaux-de-frise*, and other obstacles, either in defending a town against besiegers, or in suppressing popular tumults. In a ship, a strong wooden rail, supported on stanchions, and extending across the foremost part of the quarter-deck, is called a barricade; during a naval action, the upper part of this barricade is sometimes stuffed with hammocks in a double rope-netting, to serve as a screen against the enemy's small-shot. B. have been made use of in street-fights since the middle ages, but they are best known in connection with the insurrections in the city of Paris. As early as 1358, the streets of Paris were barricaded against the dauphin, afterwards Charles V. A more noteworthy barricade-fight was that in 1588, when 4000 Swiss soldiers, marched into Paris by Henry III. to overawe the council of sixteen. would have been utterly destroyed by the populace, firing from behind B., had the court not consented to negotiation; and the result was, that the king fled next day. The next barricade-fight of importance in Paris was that of 1830, which resulted in the expulsion of the Bourbons from the throne of France, and the election of the citizen king, Louis Philippe. During the three days which this revolution lasted, the number of B. erected across the streets amounted to several thousands. They were formed of the most heterogeneous materials—overturned vehicles, trees, scaffolding-poles, planks, building-materials, and street paving-stones, men, women, and children taking part in their erection. In Feb., 1848, the insurrection against Louis Philippe commenced with the erection of B.; but the most celebrated and bloody barricade-fight was that between the populace and the provisional government, which, commencing on the night of the 23d June, 1848, lasted throughout the three following days, when the people had to surrender. The national losses by this fight were estimated at 30,000,000 francs; 16,000 persons were killed and wounded, and 8000 taken prisoners. The emperor Napoleon III. has so widened and macadamized the principal streets of Paris since he ascended the throne, as to render the successful erection of B. next to impossible. There was a remarkable barricade-erection in London in 1821. The ministry desired that the body of queen Caroline should be conveyed out of the country to Germany, for interment, without the populace having the opportunity of making any demonstration. On the matter becoming known, a vast barricade was erected at the point where the Hampstead road joins the new road; and as nothing but the use of artillery could have forced the way, the officer in charge of the funeral cortege deemed it prudent to change his course, and pass through a more central part of the metropolis. During the revolutions of 1848, B. were successfully carried in Paris, Berlin, Vienna, and other places, by abandoning the attack in front, and breaking through the houses of contiguous streets, taking their defenders in the rear.

BARRIE, a t. in Canada, capital of Simcoe co., 60 m. n.n.w. of Toronto, at the w. end of lake Simcoe. It has manufactories of woolen goods; pop. '71, 3298.

BARRIER ACT, the name commonly given to an act of the general assembly of the church of Scotland, 8th Jan., 1697, intended as a barrier against innovations, and a hindrance to hasty legislation. It provides that no change can be made in the laws of the church without being submitted, by that general assembly which first approves it, to the consideration of all the presbyteries, and approved by a majority of them; after which it still remains to be considered by the next general assembly, which then may or may not pass it into a law. The B. A. is regarded as of the greatest importance, both in the established church of Scotland and in the Free church. Analogous regulations have been adopted by other Presbyterian churches.

BARRIER REEF, an immense coral-reef extending along the n.e. coast of Australia for nearly 1300 m., at a distance from the shore of from 10 to upwards of 100 miles. The reef is, in general, precipitous, and in many places rises out of great depths, lines of 280 fathoms having failed to reach the bottom on the outer side. Formerly, ignorance of anything like its precise extent and character led to many shipwrecks, but within the last thirty years it has been surveyed, and pretty accurately laid down on charts. In the course of its length there are several breaks or passages in it. In the voyage from Sydney to Torres strait, the inner route is usually taken. It is narrow,

and requires delicate steering; but it is safe, and not so much exposed as the outer route, which enters Torres strait by Flinders entrance.

BARRING OUT, a practice formerly very common in schools, but now almost, if not altogether, abandoned. It consisted in the scholars taking possession of the school, and fastening the doors against the master, at whose helplessness they scoffed from the windows. The usual time for B. O. was immediately prior to the periodical vacation. It seems to have been an understood rule in B. O. that if the scholars could sustain a siege against the master for three days, they were entitled to dictate terms to him regarding the number of holidays, hours of recreation, etc., for the ensuing year. If, on the other hand, the master succeeded in forcing an entry before the expiry of that period, the insurgents were entirely at his mercy. The masters, in most cases, appear to have acquiesced good-humoredly in the custom; but some chafed at it, and exerted their strength and their ingenuity to storm or surprise the garrison. Addison is said to have been the chief actor in a B. O. of the master of Lichfield. One remarkable and fatal case of B. O. occurred at the high school, Edinburgh, in Sept., 1595. The scholars had to complain of an abridgment of their usual holidays by the town-council, who, on being remonstrated with, refused, even though the claim was supported by the master, to grant more than three of the eight days which the boys demanded as their privilege. They, accordingly, took advantage of the master's temporary absence to lay in a store of provisions, and having done so, they barricaded the doors. The magistrates, the patrons of the school, in vain sought admission, the boys saying they would treat with their master only; and after a day and night had passed, it was resolved to force an entrance. The result was, that one of them, Bailie Macmoran, was shot dead on the spot by a scholar named Sinclair. The scholars of Witton school, Cheshire, were directed by the statutes drawn up by the founder, Sir John Deane, to observe the practice: "To the end that the schollars have not any evil opinion of the schoolmaster, nor the schoolmaster should not mistake the schollars for requiring of customs and orders, I will that upon Thursdays and Saturdays in the afternoons, and upon holy-days, they refresh themselves—and a week before Christmas and Easter, *according to the old custom, they bar and keep forth the school the schoolmaster, in such sort as other schollars do in great schools.*" This school was founded in 1558. See Brand's *Popular Antiquities*, Chambers's *Domestic Annals*, and Carlisle's *Endowed Grammar Schools*.

BARRINGTON, Daines, 1727–1800; third son of John Shute; antiquary and naturalist. He followed the law, and wrote *Observations on the Statutes from Magna Charta to 21st James I., being a Proposal for Remodeling them*," a work of high reputation. In 1771, he published *Orosius* in English, with king Alfred's Saxon version; and two years later, *Tracts on the Probability of Reaching the North Pole*. Among his most curious productions is *Experiments and Observations on the Singing and Language of Birds*.

BARRINGTONIA'CEÆ, a natural order of exogenous trees and shrubs, natives of tropical countries, and generally very beautiful both in foliage and flowers. Few plants, indeed, exceed some of them in beauty. The stamens are very numerous, and form a very conspicuous part of the flower. The fruit is fleshy, with bony seeds lodged in pulp. That of some species is eaten, as *careya arborea*, an Indian tree, the stringy bark of which is used in the countries along the foot of the Himalayas as a slow-match for matchlock guns. Humboldt and Bonpland mention that children become quite yellow after eating the fruit of an American species, *gustavia speciosa*, of which, however, they are very fond; but that this color disappears in a day or two. The Moordilla (*barringtonia speciosa*) is described by Sir J. E. Tennent as a tree which much attracts the attention of travelers in Ceylon. It has dark, glossy leaves, and delicate crimson-tipped white flowers. "The stamens, of which there are nearly 100 to each flower, when they fall to the ground, might almost be mistaken for painters' brushes." Some botanists include this order in *myrtaceæ* (q.v.).

BARRISTER, Revising. See Revising Barrister.

BARRISTERS, or Barrasters, as sometimes spelt in old books. This is the distinctive name by which the advocates or pleaders at the English and Irish bars are known; and thus its derivation is perhaps sufficiently accounted for. They are admitted to their office under the rules and regulations of the Inns of Court (q.v.), and they are entitled to exclusive audience in all the superior courts of law and equity, and generally in all courts, civil and criminal, presided over by a superior judge. In the whole of the county courts, attorneys are allowed to practice without the assistance of counsel; also at petty sessions, though at the quarter sessions where four counsel attend, the justices always give them exclusive audience. In Scotland, the same body are styled Advocates (q.v.), and they have the same exclusive privileges that B. enjoy in England and Ireland. These Scotch advocates, however, are members of the faculty of advocates, or Scotch bar, properly so called, and are not to be confounded with the advocates who practice under that name in the town and county of Aberdeen, and who, as explained in a former article, are merely country attorneys. See Attorneys and Solicitors.

Barristers were first styled *apprentices*, who answered to the bachelors of the universities, as the state and degree of a sergeant did to that of a doctor. These apprentices or barristers seem to have been first appointed by an ordinance of king Edward I. in parlia-

ment, in the twentieth year of his reign (Stephen's *Commentaries*, vol. i. p. 17, and authorities there referred to). Of barristers, there are various ranks and degrees, and among each other they take precedence accordingly; the general name, "counsel," being, in the practice of the court, common to them all. But they may be divided into three leading bodies. 1*st*, barristers simply or utter barristers, who occupy the position of junior counsel, wearing a plain stuff-gown and a short wig; 2*d*, *sergeants-at-law*, a legal order of very ancient state and degree, and who are distinguished by the *coif* and other peculiarities (see SERGEANT-AT-LAW); and 3*d queen's counsel*, or her majesty's counsel learned in the law, as they are more formally called, and who may be selected either from the outer or junior bar, or from the sergeants. They may be described as the ordinary leaders of the bar, and are distinguished by a silk gown, and on state-occasions, and always in the house of lords, they wear a full-bottomed wig. For further details, see QUEEN'S COUNSEL. Besides these three orders or gradations of rank at the English bar, the crown sometimes grants letters patent of precedence to such barristers as her majesty may think proper to honor with that mark of distinction, whereby they are entitled to such rank and pre-audience as are assigned to them in their respective patents. See PRECEDENCE.

Thus constituted, the English bar perform their functions, enjoying many professional privileges and immunities, and a high social position. As we have before stated, they have exclusive audience in all the superior courts, whereupon terms and conditions, and according to an etiquette, which are all well understood by attorneys or solicitors, they take upon themselves the protection and defense of any suitor, whether plaintiff or defendant. With the *brief* (q.v.) or other instructions, by means of which their professional services are retained, B. receive a *fee*, or such fee is indorsed on the brief or instructions, and afterwards paid. Such, generally, is the existing practice at the English bar, differing in this respect from the practice of the bar in Scotland—and, we believe, to a great extent in Ireland also—where *pre*-payment of the fee is the rigid etiquette. The amount of this fee in England depends, of course, on the nature of the business to be done, the time to be occupied, and the labor to be bestowed; and it is usually, especially in the case of leading counsel, a liberal sum. The barrister's fee, however, is not a matter of express contract or stipulation, recoverable at law like an attorney's bill of costs, but is regarded as a mere honorary reward—*guiddam honorarium*, as it is called in law-books. There is, therefore, no means of enforcing its payment, and indeed, in this respect, the barrister has nothing to rely upon but the honor and good faith of those who employ him. Where, however, it can be proved that the client or party gave money to the solicitor or attorney, with which to fee the counsel, the latter may maintain an action against the former for the amount in some special cases.

In order to encourage due freedom of speech in the lawful defense of their clients, and, at the same time, to give a check to unseemly licentiousness, it has been held that a counsel is not answerable for any matter by him spoken, relative to the cause in hand, and suggested in his client's instructions, although it should reflect upon the reputation of another, and even prove absolutely groundless;* but if he mentions an untruth of his own invention, or even upon instructions, if it be impertinent to the cause in hand, he is then liable to an action from the party injured; and counsel guilty of deceit or collusion are punishable by the statute Westm. I. (3 Edw. I., c. 28) with imprisonment for a year and a day, and perpetual silence in the courts—a punishment which may be inflicted for gross misdemeanors in practice, although the course usually resorted to is for the benchers of the inn of court, to which the person so offending belongs, to *disbar* him. See Stephen's *Commentary*, and Ker's *Blackstone*, and see BENCHERS and DISBAR.

But besides advocacy and forensic disputation, B. in England have other business to which they have extended their practice, to the great advantage of the public. This additional practice consists in advising on the law by their opinion on a case stated, by means of which harassing and fruitless litigation is often prevented (see OPINION OF COUNSEL); in drawing or preparing the pleadings or statement of facts on which an action or suit is founded (see PLEADING); and in preparing the drafts or scrolls of legal instruments, indentures, deeds, contracts, or other conveyances. See CONVEYANCING and CONVEYANCER. As a correlative privilege of the position in which they stand in respect of their fees, barristers are not personally liable for the injurious consequences of any erroneous advice they may give; and they claim absolute control over the conduct of all litigation in which they may be engaged, even to withdrawing it from court, unless the client expressly dissent; and until lately, it was the opinion of the profession that counsel might at any time, during the progress of a cause, compromise the matter in dispute; but the exercise of such discretion was successfully opposed in a recent case, and it is now admitted that B. have no *ex officio* privilege beyond the guidance and conduct of actual litigation in court.

It is from the body of B. that all the judges in England, superior and inferior, are appointed; and B. are also always chosen for the office of paid magistrate. The only exception to the exclusive appointment of B. to judicial offices, is the case of justices at petty and quarter sessions, chiefly a criminal jurisdiction, but which works well in practice, and has many claims to consideration. See QUARTER SESSIONS.

* But the publication of the counsel's statement by a *third party* may expose such third party to an action.

The bar in Ireland stands on the same footing, and has the same ranks and degrees, and is subject very much to the same rules and regulations, as the English bar; and in that country, barrister also is the name by which the profession of an advocate is distinguished. In Scotland, the same office is simply called by its own name of *advocate*. See ADVOCATES, FACULTY OF.

At the bar of the house of lords, and before parliament generally, before the privy-council, and also, it is believed, in all trials for high treason, whether in England, Ireland, or Scotland, the three bars rank on a footing of equality, taking precedence according to the date of their call and admission to their own respective bars, with the exception of those who are queen's counsel, who recently have also been introduced into Scotland, and now are next in precedence to the lord advocate (see ADVOCATE, LORD), the *solicitor general of Scotland* (q.v.), and the *dean of faculty* (q.v.). It was at one time disputed between the lord advocate of Scotland and the attorney-general of England, which of them should lead the other at the bar of the house of lords; and a case occurred in 1834 in the house of lords, before lord chancellor Brougham, in which very high pretensions were urged on behalf of both functionaries. These were the late lord chancellor Campbell as attorney-general, and the late lord Jeffrey as lord advocate, who contended that as he was not only the first law-officer of the crown in Scotland, but also a high political officer, he was entitled to lead the former. But the house decided that the attorney-general of England has precedency over the lord advocate of Scotland, in all matters in which they may appear as counsel at their lordships' bar; and it is presumed that the same rule would be followed before parliament generally, the privy-council, and in all trials for high treason, whether in England, Ireland, or Scotland. The relative rank of the *Irish* law-officers to English is the same.

It only remains to be added, that as the three bars are on a footing of equality in the house of lords, and the other imperial and supreme tribunals above mentioned, the English bar have no exclusive audience in these, even in English cases; but all causes whatever there, whether English, Irish, Scotch, or colonial, may be equally and indiscriminately taken and advocated by English, Irish, or Scotch counsel.

BARRON, a co. in n.w. Wisconsin, on the upper streams of Red Cedar and Hay rivers; 1080 sq.m.; pop. '75, 3337. It is for the most part covered with forests. Productions, agricultural. Co. seat, Barron.

BARRON, JAMES, 1768–1851; b. Virginia; commodore in the United States navy and son of a commodore of the same name. B. commanded the *Chesapeake* when the British ship *Leopard* undertook to search her for deserters, June 22, 1807. B. resisted, but his vessel was in no condition to fight, and he was compelled to surrender. This act precipitated war with England. B. was suspended and tried on various charges, but not convicted. After some years spent in merchant service, he sought restoration to the navy, but found many of the officers opposed to him, among them Decatur, whom B. challenged, and they fought at Bladensburg, Mar. 22, 1820. At the first shot both fell; Decatur died in a few hours, and B. recovered some months later. In late life B. was in office on shore duty, and was offered but declined the command of the Pacific squadron. At his death he was the oldest naval officer of the United States.

BARRON, SAMUEL, 1763–1810; b. Virginia, brother of James. He was conspicuous in the war with Tripoli, but in consequence of ill health resigned his command in favor of commodore John Rogers. Just before his death B. was made commander of the Gosport navy yard.

BARRON, SAMUEL, b. Virginia; an American naval officer who went over to the confederacy in 1861. He was in the *Brandywine* when she took Lafayette to France in 1825, and became captain in 1855. When Fort Hatteras was taken, Aug. 29, 1861, B. was made a prisoner, but exchanged in 1862, and went to England to fit out privateers. After the war he engaged in farming in Virginia.

BARROS, JOÃO DE, the most distinguished of Portuguese historians, was born of an ancient and noble family at Viseu in 1496; became a page to king Emmanuel, and afterwards companion to the crown Prince. He pursued his classical and other studies with great diligence, and wrote a historical romance in his 24th year, which attracted much admiration by the peculiar beauty of its style. Hereupon the king assigned him the task of writing the history of the Portuguese in India, which he undertook, but of which only the first three decades proceeded from his pen, under the title of *Asia Portugueza* (Lisb. 1552–63); the continuation extending to twelve decades, was the work of Diego de Couto. (A new edition of the whole appeared at Lisbon, in 8 vols., in 1778–88.) B. was for some time governor of the Portuguese settlements in Guinea, and afterwards treasurer and general agent for the Indies. In 1539, the king bestowed on him the province of Maranhao in Brazil, that he might found a colony there; but he was obliged to renounce the enterprise after much loss. He died at his estate of Alitem on the 20th of Oct. 1570.

BARROSA, a village of Spain 16 m. s.s.e. of Cadiz, celebrated in history as the place where gen. Graham (afterwards lord Lynedoch), in Mar. 1811, with a handful of English troops, succeeded in gaining over the French, after his Spanish allies had retreated, one of the most glorious victories of the Peninsular campaign. More than 2000

French were killed and wounded (some authorities give nearly 3000 killed alone), 300 prisoners taken, 6 pieces of cannon, and an eagle—the first captured in the war.

BARROT, CAMILLE HYACINTHE ODILLON, a French jurist and statesman, son of a member of the convention, and afterwards of the council of five hundred, was b. at Villefort, Lozère, 19th July, 1791. In 1814, he became an advocate in the court of cassation, Paris, and soon acquired a high reputation as an eloquent pleader. Entering the chamber of deputies young, he in time came to be regarded as one of the most influential leaders of the liberal opposition. At the revolution of 1830, he was one of the three commissioners appointed by the provisional government to accompany Charles X. from Rambouillet to Cherbourg, on his embarkation to England. Under the new government, he was appointed prefect of the department of the Seine; and in Lafayette's ministry, a member of the council of state. In a few months, however, he resigned his office of prefect, and declined the post of ambassador at Constantinople, offered him by Louis Philippe. After Casimir Périer became minister, he lost also his place in the council of state. He now began his opposition career in the chamber of deputies against the reactionary policy of the government, and became the rallying-point for all who desired the carrying out of the principles of the July revolution. He essentially contributed to the removal of the doctrinaires (q.v.) from office, in Feb. 1836, and energetically opposed the ministry of Molé, even supporting the doctrinaires in accomplishing its overthrow, in Jan. 1839. The same year he visited England and Scotland. When, in Mar. 1840, Thiers was placed at the head of the government, B. for the first time declared himself in favor of the ministerial policy on the oriental question. On the return of Guizot to office in Oct. following, his opposition to the government was renewed. Taking a conspicuous part in the reform movement of 1847, he attended several of the provincial reform banquets, which led to the revolution of 1848. On the outbreak of the struggle of 23d Feb., when Louis Philippe called upon Thiers to form a new ministry, B. was appointed president. His advice to the king to withdraw his troops proved fatal to the throne of July. In the last sitting of the chamber of deputies, B. supported the claim of the count de Paris to the throne, and the regency of the duchess of Orleans. Under the presidency of Louis Napoleon he was for some time a minister, and conducted the government with success till 1851, when he retired from active political life. He, however, took part in the conference in favor of Poland, held at Paris in 1864. In 1872, he was made a councilor of state and vice-president of the council. In his retirement, he wrote a pamphlet, *De la Centralisation et de ses Effets* (1861), etc. He died in 1873.

BARROW, a distinctive term applied to two prominent localities of the Arctic ocean, in honor of the secretary to the admiralty of the same name, the prime mover in the more recent era of northern discovery.—1. *Point B.* in lat. 71° 23′ n., and long. 156° 31′ w., generally received as the most northerly spot on the American mainland; see, however, BELLOT STRAIT. From this circumstance, it has also been called *Cape North*—a designation inconveniently ambiguous, as tending to confound this headland at once with cape North in Asia, and North cape in Europe. 2. *Barrow Strait,* the earliest of Parry's discoveries, leading to the w. out of Lancaster sound, which Parry's immediate predecessor, captain, afterwards sir John Ross, had pronounced to be landlocked in that direction. Besides its main course, B. strait throws off *Prince Regent's Inlet* to the s., and *Wellington Channel* to the north. The passage averages about 40 m. in breadth, extending pretty nearly along the parallel of 74° n., from 84° to 90° west.

The interval between these two localities, thus spanning 66° of long. or at least 2000 m., only one navigator has ever traversed—the indefatigable M'Clure, carrying his good ship, the *Investigator,* round point B. and leaving her behind him only when almost in sight of B. strait.

BARROW, a river in the s.e. of Ireland. Of the Irish rivers, it is in importance next to the Shannon. It rises in the n. of Queen's co., on the n.e. slope of the Slieve Bloom ridge of mountains. It flows first e. past Portarlington to the border of Kildare co., and then s. between Queen's, Kilkenny, and Waterford counties on the w., and Kildare, Carlow, and Wexford counties on the e., passing the towns of Athy, Carlow, and New Ross. It has a course of 100 m. through a carboniferous, granitic, and silurian basin. Two m. above New Ross it receives the Nore (q.v.), and eight m. e. of Waterford, it is joined by the Suir (q.v.). These three rivers (called the Three Sisters, from their rising in the same mountain-ridge, and joining near the sea, after flowing through different counties) form, near the sea, the large and secure estuary of Waterford harbor, 9 m. long. The B. is navigable for ships of 300 tons to New Ross, 25 m. up, and for barges to Athy, 65 m. up, whence the grand canal communicates with Dublin. The B., below Portarlington, falls 227 feet.

BARROW, ISAAC, an eminent English mathematician and divine, was b. in 1630. He received his early education at the Charter-house, where he was distinguished chiefly by his negligence and pugnacity. At Felstead school, in Essex, to which he went next, he greatly improved; and in 1643, he was entered at Peter-house, Cambridge, under his uncle, Isaac Barrow, then a fellow of that college, and finally bishop of St. Asaph. On the ejection of his uncle in 1645, he removed to Trinity college, where he became B.A. in 1648, fellow in 1649, and M.A. in 1652. Finding that to be a good theologian he must know chronology, that chronology implies astronomy, and astronomy mathematics, he

applied himself to the latter science with distinguished success. To the classics he had already devoted much study, and on the vacancy of the Greek chair, he was recommended for the office; but a suspicion of Arminianism interfered with his success. After this disappointment, he went abroad (1655), and traveled during four years through France and Italy, to Smyrna and Constantinople, back to Venice, and home through Germany and Holland. On the voyage from Leghorn to Smyrna, his determined personal courage seems to have been instrumental in scaring away an Algerine pirate, after a brisk exchange of shots. Soon after his return he took orders, and in the following year was appointed professor of Greek. The neglect with which he was treated after the restoration is celebrated in his couplet addressed to the king—

Te magis optavit redditurum, Carole, nemo,
Et nemo sensit te redisse minus.

In 1662, he was appointed to the Gresham professorship of geometry, which, on his being appointed to the Lucasian professorship in 1663, he thought it his duty to resign. The latter also he resigned in 1669, in favor of his pupil Isaac Newton. On quitting his professorship, he obtained from his uncle a small living in Wales, and from Dr. Seth Ward, bishop of Salisbury, a prebend in that cathedral. He devoted the revenues of both to charitable purposes, and resigned them in 1672, on being appointed by the king master of Trinity college. To him, while in this office, is due the foundation of that valuable library, which is one of the chief ornaments of the university. In 1675, he was nominated vice-chancellor of the university; and in 1677, he d. at the early age of 47, having achieved, by his numerous able works, and the force of his noble personal character, a reputation which time has left unimpaired. Of his original mathematical works, the principal are his *Lectiones Geometricæ* and *Lectiones Opticæ*, of which it has been said that they are "a mine of curious interesting propositions, to which geometry is always applied with particular elegance." As a theologian, his fame rests chiefly on his sermons, which are very remarkable as specimens of clear, exhaustive, and vigorous discussion. His sermons, it may be added, were generally of excessive length. One, on charity, lasted three hours and a half; and at Westminster abbey, he once detained the audience so long that they got the organ to play "till they had blowed him down." B.'s English works, consisting of sermons, expositions, etc., have been edited by Dr. Tillotson, dean of Canterbury, and prefaced with a life by Mr. Hill. His works, besides those already mentioned, are very numerous, and include *Euclidis Elementa*, *Euclidis Data*, *Mathematicæ Lectiones*, *Opuscula*, containing Latin sermons, poems, speeches, etc. *Lectiones Mathematicæ* and *L. Geometricæ* have been translated by Kirby and Stone. *Euclidis Elementa* has also been translated.

BARROW, Sir JOHN, Baronet, an English traveler, was b. on the 19th June, 1764, at Drayleybeck, in Lancashire; was early instructed in mathematics; and after having published a small volume on land-surveying, filled a situation in a Liverpool iron-foundry, visited Greenland with a whaler, and after his return taught mathematics in an academy at Greenwich. He received an appointment as private secretary and keeper of accounts to lord Macartney, who went as ambassador to China. He availed himself of his residence in China to learn the Chinese language, and to collect valuable materials for the account of China, which he afterwards gave to the world, partly in articles in the *Quarterly Review*, and partly in his *Travels in China* (Lond., 1804). When lord Macartney afterwards became governor of Cape Colony, Barrow availed himself of his residence in s. Africa to make extensive excursions in the interior of the country, which he described in his still valuable *Travels in the Interior of Southern Africa* (2 vols., Lond., 1801–3). Having returned to London, in the year 1804, he was appointed by lord Melville secretary to the admiralty, which situation he continued to hold till 1845, except for a short time in 1806. Besides the works above mentioned, B. published *A Voyage to Cochin-China in the Years* 1792 *and* 1793 (Lond., 1806), *The Life of Macartney* (2 vols., Lond., 1807), *A Chronological History of Voyages into the Arctic Regions* (Lond., 1818); also a series of lives of English naval worthies. Under Peel's ministry in 1835, he was raised to the baronetcy. In the year 1845, he retired from public service, but afterwards published *An Autobiographical Memoir* (Lond., 1847), and *Sketches of the Royal Society*, and d. at London, 23d Nov., 1848. He rendered many services to geographical science by suggesting and promoting scientific expeditions; with him also originated the idea of the geographical society, founded in 1830, of which he was vice-president till his death.

BARROW-IN-FURNESS, a seaport and rapidly increasing t. of n. Lancashire, England, situated on the south-western coast of the peninsula of Furness, opposite to a small island called Barrow island, which is traditionally reported to have been in former times a burial-place of Norse rovers. It is 8 m. s.w. from Ulverston, and 18 m. w.n.w. from Lancaster. It is connected by railway with Dalton, from which it is not quite 4 m. distant, and so with the whole railway system of England. The growth of B. has of late years been so rapid as to be almost unparalleled in the history of the towns of England. In 1847, it was an insignificant fishing-village of about 300 inhabitants; in 1857, the population was more than 2000, a large proportion being sailors and fishers; in 1871, the population had increased to 18,245; and by 1875, it was above 40,000. This rapid increase is owing to the great quantity of iron ore, of the best

quality—red hematite—which exists in the neighborhood, and the establishment both of mines and smelting-works. A small qantity of iron ore from this neighborhood was, for many years, exported to be smelted elsewhere; but about the year 1859, smelting-works were established at B. by Messrs. Schneider, Hannay, & Co., which soon gave employment to a great number of men, and converted the old fishing-village into a prosperous town. In 1865, these works produced about 160,000 tons of iron. In 1866, the Barrow iron-works were taken over by the Barrow hematite steel company, which has now 12 blast-furnaces in constant operation, and 18 converters for making Bessemer steel. The company partly raise their own ore, employ at their works and mines nearly 5000 men, and utilize about 500,000 tons of ore annually. The amount of pig-iron made weekly is about 5500 tons, of which nearly 1000 tons are taken to the steel-works, and their converted by the Bessemer process into steel. Great quantities of limestone and coke are used in the iron-furnaces and steel-works. The red hematite of B. yields an average of 57 per cent of iron. The B. steel-works are the largest Bessemer steel-works in Britain, producing about 110,000 tons of steel annually. In the B. works, the iron is conveyed in a molten state from the blast-furnaces to the "converters," where it is made into steel. Some of the steam-hammers employed have heads of five tons weight, and some of six tons. Copper as well as iron ore is obtained in considerable quantity near B., and is exported to the amount of about 3000 tons annually. About 20,000 tons of slate are also annually quarried in the neighborhood, and sent by coasters or by rail to other parts of Great Britain.

The town of B. is built on a regular plan, mostly in rectangles. St. George's church is a handsome Gothic building, erected chiefly at the expense of the dukes of Devonshire and Buccleuch, the principal land-owners of the town and neighborhood. There are other places of worship belonging to the church of England and other denominations.

The Furness railway company have recently expended a large sum of money in converting the channel between the mainland and Barrow island into docks. The total cost is estimated at £200,000. There are three principal docks. The Ramsden dock, when completed, will give a water area of 200 acres. Barrow island has become a great seat of iron ship-building. A large jute-work employs 2000 hands. Other branches of industry have also begun to be attracted to Barrow. Its foreign trade is increasing; the imports include timber from Sweden and Canada, coal from Wales, and preserved provisions from New York. The chief exports are ore, steel rails—of which about 20,000 tons are shipped annually—and pig-iron. Steamers ply regularly between Belfast, Glasgow, and Douglas, Isle of Man. The interesting ruins of Furness abbey lie within 2 m. from the town; while on Piel island there are the ruins of a castle built by the abbot of Furness. From the excellence of the harbor, the abundant facilities of railway conveyance, and the mineral wealth of the district, it may confidently be expected that B. will still rapidly increase in importance.

BARROW-ON-SOAR, a village in the n. of Leicestershire, 10 m. n. of Leicester. It is noted for its blue lime or terras, which makes good cement under water. It has manufactures of lace and stockings. It has free schools and several charities; and is the seat of the poor-law union of the district, with a workhouse capable of accommodating 500 persons.

BARROWS, artificial mounds of earth generally believed to have been erected for sepulchral or monumental purposes. They are very numerous in Great Britain, and many of them are supposed to belong to a period long prior to the Roman invasion. The counties of Wilts and Dorset are especially rich in these remains, and the B. of the former have been thoroughly explored, described, and classified by sir R. C. Hoare in his *Ancient Wiltshire* (2 vols. fol. 1810–21). In the sepulchral B., the human remains are buried either in a rude stone "cist" or chest, in which the body was doubled up, or are laid at full length in the earth, accompanied by arms and other utensils. Where the body was burned, the remains were laid on the floor of the barrow, in a cist excavated on the spot, or at a later epoch, in a clay urn. Sir R. Hoare considers the Wiltshire B. as indicating three stages in the progress of society. The first class contains spear and arrow heads of flint and bone; the second of brass; and the third contains arms and instruments made of iron. One of the largest barrows in Europe is Silbury hill, near Marlborough, in Wiltshire, which covers 5 acres, 34 perches of land, and has a slope of 316 ft., with a perpendicular height of 170. According to sir R. Hoare, barrow-burial was practiced down to the 8th c., from a period of unknown antiquity. The practice of erecting sepulchral mounds prevailed among all the principal nations of antiquity both in Europe and Asia, and they are found in great numbers in Central America. Many barrows are only partly artificial; natural mounds having been shaped by human hands into the form, round or oblong, which it was wished they should take.

BARROWS, ELIJAH PORTER, S.T.D.; b. Conn., 1805; a graduate of Yale; pastor of the First Presbyterian church in New York, 1835; professor of sacred literature in Western Reserve college, 1837–52; professor of Hebrew language and literature in Andover theological seminary, and afterward in Oberlin theological seminary. He is the author of *Companion to the Bible, Sacred Geography and Antiquities*, and has published many essays in religious periodicals.

BARRUN'DIA, JOSÉ FRANCISCO, 1780–1854, a Guatemalan statesman, early opposed to Spain, and in 1813 sentenced to death for treason. He escaped, hid for six years in the mountains, headed a party of revolutionists, and continued conspicuous through the war for independence. He was president of Guatemala in 1829, and again in 1852. In 1854, he came to the United States as minister from Honduras, with the purpose of procuring the annexation of that territory to the American union, but died from apoplexy soon after his arrival.

BARRY, a co. in s.w. Michigan, traversed by a branch of the Michigan Central railroad; 576 sq.m.; pop. '74, 22,051; in '80, 25,320. The surface is undulating prairie and woodland, dotted with small lakes. Cereals and dairy produce are the staples. Co. seat, Hastings.

BARRY, a co. in s.w. Missouri, on the Arkansas border; drained by White river; 703 sq.m.; pop. '70, 10,373—53 colored; in '80, 14,434. It produces cereals and tobacco. Co. seat, Cassville.

BARRY, a small island, of about a mile long, in the Bristol channel, off the s. coast of Glamorganshire, 10 m. s.w. of Cardiff. It has the ruins of an ancient castle and of two chapels. On Nell's point, in the s. part of the island, is a fine well, to which great numbers of women resort on Holy Thursday, and having washed their eyes in the spring, each drops a pin into it.

BARRY (in Heraldry), the term applied to a shield which is divided transversely into four, six, or more equal parts, and consisting of two or more tinctures interchangeably disposed.

Barry-bendy is where the shield is divided into four, six, or more equal parts, by diagonal lines, the tincture of which it consists being varied interchangeably.

Barry-pily is where the shield is divided by diagonal lines, the colors being interchanged as in the example.

BARRY, COMTESSE DU. See DU BARRY.

BARRY CORNWALL. See PROCTER, BRYAN WALTER.

BARRY, Sir CHARLES, R.A., architect of the two houses of parliament, son of Walter Barry, esq., Westminster, was b. there in May, 1795. Educated at private schools in Leicestershire and Bedfordshire, he was indentured to Messrs. Middleton and Bailey, architects, Lambeth. In 1817, at the age of 22, he went to Italy. A wealthy countryman of his own, attracted by the beauty of his drawings, took him with him to Egypt as his companion, defraying his expenses. He also visited Greece and Rome. On his return to England after an absence of three and a half years, he became the successful competitor for the design of a church at Brighton. He was also the architect of the Manchester Athenæum, a building in the Grecian style, and of the grammar school of king Edward VI. at Birmingham; the latter esteemed the most beautiful of his works. In London, he designed the traveler's club and the reform club, both in Pall Mall, and the college of surgeons, Lincoln's Inn Fields. After the burning of the old houses of parliament in 1834, on a public competition, B.'s design for the new building was adjudged the best. The work was commenced in 1840, and on 3d Feb., 1852, her majesty opened the Victoria tower and royal gallery in state, and on the occasion knighted the architect. Chosen a royal academician in 1842, sir Charles was also a fellow of the royal society, of the society of arts, and of the institute of British architects. He died May 12, 1869.

BARRY, EDWARD MIDDLETON, b. 1830, an English architect, pupil of his father, whom he succeeded as architect of the houses of parliament. He is the architect of the new Covent Garden theater, the Charing Cross, and Star and Garter hotels, and of the new national gallery.

BARRY, JAMES, a historical painter, b. at Cork, Oct. 11, 1741, and distinguished more by the force of his conception than the excellence of his manipulation or the beauty of his color. Dr. Johnson's criticism on his works was: "Whatever the hand may have done, the mind has done its part. There is a grasp of mind there which you will find nowhere else." The *chef-d'œuvre* of B. is the "Victors at Olympia"—a work, the sight of which, Canova said, was of itself sufficient to repay a journey to England. B. was a protégé of Edmund Burke. He was of irritable temper, which led him into many quarrels, and the result of one with the royal academy was his expulsion from the academy. He died on the 22d Feb., 1806, in poor circumstances, while some friends were engaged in raising subscriptions to purchase him an annuity.

BARRY, JOHN, 1745–1803; b. Ireland; came to America about 1760; one of the earliest American naval officers. In 1776, in command of the *Lexington*, 14 guns, he captured the tender *Edward*, the first ship ever taken by a commissioned officer of the U. S. navy. In 1781, while returning from France in the *Alliance*, he captured two vessels, being severely wounded in the conflict. He was the first senior officer with the rank of commodore on the establishment of the present navy.

BARRY, MARTIN, a physiologist of eminence, was b. at Fratton, Hampshire, in 1802. He studied at the medical schools of London, and also at the university of Edinburgh, where he took his degree of M.D. in 1833. He wrote much on physiological subjects,

and especially on animal development and embryology, for discoveries in which he is best known. Until the publication of his papers in the *Philosophical Transactions* of the royal society of London in 1840–43, it was not known that spermatozoa actually penetrate *within* the ovum, and physiologists are also indebted to him for the knowledge of the segmentation of the yelk in mammals. In his private capacity, B. was amiable and greatly benevolent. His means being ample, he gave his professional services largely to the poor, and he acted as house-surgeon to the Edinburgh royal maternity hospital. He died at Beccles, in Suffolk, in April, 1855.

BARRY, WILLIAM FARQUHAR, b. New York, 1818; col. of artillery and brevet brig.gen. of the U. S. army; was in the Florida Indian war, and aid to gen. Worth in the Mexican war. In the rebellion he was chief of artillery of the army of the Potomac, and participated in a number of battles and in the siege of Yorktown. In 1867, he was made commander of the artillery school at Fortress Monroe, where he remains.

BARS, a province in n.w. Hungary around the head streams of the Danube. It is mountainous, but rich in gold, silver, and other minerals. The mines of Skleno and Vihnye are the most remarkable. The chief towns are Kremnitz and Nuesohl. Pop. '69, 137,191, mainly Roman Catholics.

BARSCH, or BARS, a fortified town of Hungary, capital of the county of the same name. It is situated on the Gran, which divides it into old and new Barsch. It is a mart of some importance for grain and fruit. Pop. '69, 910.

BARSU'MA, or BARSUMAS I., a Nestorian bishop of the 5th c., who induced the king of Persia to expel the Christians who followed the Greek fathers and to put Nestorians in their place. He founded the school at Nisibis, which sent missionaries to various countries. He married a nun, and maintained the right of all priests to marry. In Persia the Nestorians venerate him as the founder of their faith.

BAR-SUR-AUBE, a t. of France, in the department of Aube, situated on the right bank of the river of that name. It is an ill-built ancient town; numerous old coins and urns attesting that the Romans must have had a station here. B. was destroyed by the Huns in the 5th c., but rebuilt again soon after, when it became a place of commercial importance. A chapel built on the bridge which here crosses the Aube, now marks the spot from which the bastard of Bourbon was hurled into the river by command of Charles VII. in 1440. B. is also noteworthy as the place where the council of the allied sovereigns, which decided the plan of the campaign ending in the first fall of the empire, was held on Feb. 25, 1814; and where, two days after, the French were defeated by the allies, under the chief command of Schwarzenberg. B. has a pop. of (1876) 4495; a good trade in wine, wood, hemp, corn, and wool. Its principal industrial products are calicoes, table-covers, brandy, paper, vinegar, and nails.

BAR-SUR-SEINE, an ancient t. of France, in the department of Aube, pleasantly situated on the left bank of the Seine. It has a trade in grain, brandy, wool, and wine. Pop. '76, 2572. It is celebrated as the place where the allies, under the prince of Würtemberg, defeated the French under Macdonald, in Mar., 1814.

BARTAN', a t. of Anatolia, situated near the mouth of the Chati-su (ancient *Parthenius*) on the Black sea. Pop. 10,000, who carry on a brisk trade with Constantinople.

BARTAS, GUILLAUME DE SALLUSTE, a soldier, diplomatist, and man of letters, was b. at Montfort, in Armagnac, about the year 1544. His reputation was great during his life-time, alike in "the court, the camp, the grove." His chief poem is *The Divine Weeks and Works*, which gives an account of the creation, and the history of the Jews as far as the book of Chronicles, and is said to have had a considerable influence on Milton's *Paradise Lost*. Thirty editions of the work passed through the press in six years. Dryden, when a boy, thought his verse incomparably superior to Spenser's; an opinion, however, which he lived to be ashamed of having ever entertained. B.'s name is now quite forgotten, or remembered only in connection with bad taste. It is not to be denied, however, that his fancy, though generally grotesque and lawless, occasionally strikes out most picturesque imagery and epithets. His use of compound words first led to their introduction into England, through his translator Sylvester (q.v.), and to the consequent enrichment of our poetry. He died of wounds received at the battle of Ivry, 1590.

BARTER, in commerce and political economy, a term used to express the exchange of one commodity for another, as contrasted with the sale of commodities for money. It is usual to suppose that in the history of any community B. preceded the other methods of commerce, as people would find the convenience of exchanging one article for another before they were acquainted with money or credit. In point of fact, ships visiting savage countries are generally to some extent freighted with weapons, tools, or ornaments, to be used in B., if it be desirable to carry on a trade with the inhabitants. Under old artificial systems of political economy, there was much useless discussion about the question whether a B. trade or a money-payment trade was more advantageous to the community at large, and which of them should be encouraged while the other is depressed. On the one side, it was maintained that nothing but an export sale for cash was really profitable; on the other, that it was more advantageous to get goods in return,

because thus there was a double transaction and double profit. See BALANCE OF TRADE. But the simple doctrine of the present day, that whatever the merchant finds most profitable to himself will also be most profitable to the community, saves the necessity of making these distinctions, and of acting upon them by interference with commerce. B. is, in reality, one of the commonest forms of trade, taken at large in the present day. The exporter sends goods to his agent, who, without probably ever touching hard cash in the course of the transaction, lays in a cargo of import goods with the value, and these are literally brought home in exchange for those sent out.

In law, BARTER, or EXCHANGE, as it is now more generally called in law-books, is a contract for transferring property, the consideration being some other commodity; or it may be described as a contract for the exchange of two subjects or commodities. It this differs from *sale*, which is a contract for the transference of property in consideration of a price in *money*. See EXCHANGE; SALE OF GOODS.

BARTFA, or BART'FELD, a small but very old free t. of n. Hungary, in the province of Saros, on the Tepla, 155 m. n.e. of Pesth. Its position on the borders of Galicia has frequently made it a place of refuge for Poles and Russians. Its hot baths are much frequented, and a trade in wine, brandy, linen, and earthenware is carried on. Pop. '69, 5303.

BARTH, or BARDT, a t. in Pomerania, on the river B., 17 m. w. of Stralsund; pop. '71, 5774. It was once the residence of the dukes of Pomerania, and from 1630 to 1815 belonged to Sweden.

BARTH, CHRISTIAN GOTTLOB, 1799–1862; a German philanthropist and pastor, especially devoted to missionary work. He founded a school for the training of poor children. His Bible history and Bible stories have had an immense circulation.

BARTH, HEINRICH, PH.D., D.C.L., an enterprising modern African traveler. b. at Hamburg, 19th May, 1821, received his education in his native town, and afterwards went to the university of Berlin. In his youth his favorite studies were the Roman and Greek classics and antiquities, along with the geographical sciences. Hence he imbibed a strong desire to explore the shores and countries of the Mediterranean. After visiting Italy and Sicily, he embarked, in 1845, at Marseilles, and from Gibraltar passed over to Tangier in Africa. Proceeding along the Algerian coast he made excursions into the interior, to Tunis, Tripoli, and Bangazi. On his journey thence to Cairo, he was attacked by a band of Arab robbers, whom he bravely resisted, but was severely wounded, and lost all his effects and papers. He afterwards extended his researches into Egypt, Sinai, Palestine, Asia Minor, and Greece. These travels occupied him for nearly three years, and in 1849 he published, at Berlin, an account of a portion of them in a work entitled *Wanderungen durch die Küstenländer des Mittelmeeres*. On the 8th December of that year he again sailed from Marseilles, having been (along with Dr. Overweg) appointed by the British government scientific companion to Mr. James Richardson, then charged by the foreign office with a political and commercial mission to central Africa. Starting from Tripoli on the 4th Feb., 1850, Dr. B. and his companions crossed the great desert amid much difficulty and danger. B. soon separated from his friends, and pursued his researches for the most part by himself. Both Mr. Richardson and Dr. Overweg succumbed to the climate, and thenceforward B. was quite alone. He did not, however, return disheartened, but continued his explorations, which, when he returned to Tripoli in Sept., 1855, had extended over 24° of lat. and 20° of long., from Tripoli in the n. to Andamawa in the s., and from Bagirmi in the e. to Timbuctoo in the w., upwards of 12,000 miles. The result of his researches was given to the world in his *Travels and Discoveries in Central Africa*, 5 vols. (Lond., 1857–1858). Afterwards, he made several journeys in Greece, Turkey, Asia Minor, and other countries on the Mediterranean. Shortly after returning from one of these, he d. at Dresden, Nov. 25, 1865. In 1858, appeared his *Reise von Trapezunt durch die nördl. Hälfte Kleinasiens nach Skutari;* in 1862, his *Sammlung und Bearbeitung central-afrik. Vocabularien.*

BARTH, JEAN, or BART, a French naval hero, the son of a fisherman, b. in 1651 at Dunkirk, but, according to others, in the Netherlands. At an early age he entered the Dutch navy, but on the commencement of the war with Holland he passed over to the French service. As persons not of noble birth could not then obtain the rank of officer in the navy, he became captain of a privateer. In this capacity he displayed astonishing bravery, so that Louis XIV. dispatched him on a special mission to the Mediterranean. His exploits at last induced the king to appoint him lieutenant of a man-of-war. In an action against a superior English force he was taken prisoner, and carried to Plymouth, from which he made his escape in an open fishing-boat to France, where the king now raised him to the rank of captain. In the year 1696, Louis XIV. received him with distinction at Versailles, but at the same time spoke continually of the mischance which had befallen him the year before. Stung by this, B. hastened to Dunkirk, and in spite of the blockade of the harbor by the English, undertook a cruise, in which he was remarkably successful. Louis XIV., in a personal audience in 1697, appointed him to the command of a squadron, upon which B. exclaimed: "Sire, you have done well in this." The courtiers laughed, as at a piece of gross rudeness; but the king took the answer in good part, and B. very soon showed how well he merited such an appointment. The

peace of Ryswick terminated his active career. He died at Dunkirk in 1702. His rough frankness and coarse wit, in which he spared neither high nor low, made him popular, no less than his boldness and readiness for battle. When the prince de Conti was nominated king of Poland, B. was required, by command of Louis XIV., to convey him to Elsinore, and the ship being attacked by the English on the voyage, was near being taken. After the action, the prince expressed to him his great delight that they had escaped from the enemy. "We had no need," was the reply, "to be afraid of being made prisoners; I had dispatched my son with a match to the powder-magazine, to blow up the ship on the first wink!"

BARTHÉLEMY, AUGUSTE-MARSEILLE, a French poet and politician of some eminence, was b. at Marseilles in 1796. Whilst still very young, he was sent to the college of Juilly; and he had scarcely completed his studies when he began to acquire reputation in his native town as a poet of distinct promise. He was naturally attracted to Paris, where, at first, his verses, published without his name, did not attract much attention. Gradually, however, he became known; and in 1825, in conjunction with his fellow-townsman, M. Méry, he issued a collection of satirical epistles, under the title *Les Sidiennes;* and the year after, a mock-heroic poem, *La Villéliade, ou la Prise du Château de Rivoli.* This vigorous political squib had a great success: in the course of the year, it ran through fifteen editions, and is said to have put into the pocket of the young authors some 24,000 francs. Continuing to work together in opposition to the government of Charles X., and in the interest of Napoleonic ideas, they put forth upwards of 20 pieces of a like satirical cast before 1830. The revolution of July of that year found B. in prison, for an offense done to the government in one of his later publications. His liberation, of course, was immediate; and along with his friend Méry, he celebrated the victory of the people in a poem dedicated to the Parisians, and entitled *L'Insurrection,* which is characterized by the great critic, M. de Sainte-Beuve, as one of the happiest productions of the writers. A pension of 1200 francs, bestowed on him by Louis Philippe, did not deter B. from attacking his ministers with the same asperity he had exercised towards those of the dethroned monarch; and in consequence, it was within a year or two withdrawn. During all the changes which followed, B. was indefatigable as a versifier on the political events of the day; but, except for readers intimately versed in the detail of these, the mere list of his numerous productions could have only the very faintest significance. The force and brilliancy of his satire is on all hands admitted; and though, in his later years, his popularity somewhat declined, his writings throughout exercised considerable influence in determining opinion among the lively population of Paris. He was, from the first, a warm supporter of the second Napoleonic *régime.* His death took place Aug., 1867, at Marseilles, of which city he was librarian.

BARTHÉLEMY, JEAN JACQUES, a historian and antiquary, b. 20th Jan., 1716, at Cassis, near Aubagne, in Provence. He was educated under the Jesuits for the church, but soon abandoned all thought of becoming a priest, and devoted himself to the study of the Greek, Hebrew, Syriac, Arabic, and Chaldee languages, though he retained the dress and title of an abbé. He first acquired distinction by the discovery of the Palmyran alphabet. In 1745, he was appointed assistant-superintendent of the royal cabinet of medals, and in 1747 elected a member of the *Académie des Inscriptions et Belles-lettres.* To complete his studies, he visited Rome in 1754, in the suite of M. de Stainville, afterwards duke of Choiseul, and then French ambassador, where he was courteously received by pope Benedict XIV. After his return, he was again employed in the arrangement of the royal cabinet of medals, which he augmented by a great number of costly specimens. The duc de Choiseul, who became minister in 1758, placed him, by means of a pension and other favors, in a position to devote himself entirely to learned researches, which he quietly pursued till the revolution of 1789 deprived him of his offices. In Sept., 1793, he was imprisoned on charge of being an aristocrat, but almost immediately released. Shortly after, he was offered the situation of national librarian, then vacant, but his age and infirmities compelled him to decline it. He d. April 30, 1795.

His most celebrated and popular work is the *Voyage du jeune Anacharsis en Grèce dans le Milieu du quatrième Siècle avant l'ère Chrétienne,* Paris, 1788, 4 vols. (Travels of the Young Anacharsis in Greece about the Middle of the Fourth Century B.C.). The work (see ANACHARSIS) is a very pleasing and agreeable performance; exhibits an extensive knowledge of the ancient world, especially of Greece and its colonies; and abounds in observations which, if not profound, are at least judicious. Later and more severe criticism has, however, pointed out many deficiencies and anachronisms. It has been translated into almost every European language. Among Barthélemy's other works may be mentioned a romance, entitled *Caryte et Polydore* (Paris, 1760); *Explication de la Mosaïque de Palestrine* (Paris, 1760); *Réflexions sur l'Alphabet et la Langue de Palmyre* (Paris, 1754).

BARTHÉLEMY SAINT-HILAIRE, JULES, a learned Frenchman, member of the institute, and a representative of the people, was b. at Paris on the 19th of Aug., 1805. He first held a subordinate office under the minister of finance. During 1828–30, he was one of the editors of the *Globe,* a Paris paper. After the July revolution, he took part with the society *Aide-toi et le Ciel t'aidera* (q.v.), revised several of its democratic mani-

festoes, established the *Bon Sens*, and continued to attack the government of Louis Philippe in the *Constitutionnel*, the *Courrier-Français*, and the *National*. In 1833, he desisted from political strife, and betook himself to more quiet studies. In 1834, he was named *Repetiteur* for the French literature class in the *Ecole Polytechnique;* and in 1838, professor of Greek and Latin philosophy in the *collége de France*. The revolution of February, however, brought him once more into the political arena. He was appointed secretary to the provisional government, but refused his support to the government of Cavaignac, and even appeared as his accuser, though he failed to establish his charges against the suppressor of the June insurrection. B. was at first in favor of Louis Napoleon, but the *coup d'état* on the 2d of Dec., and the overthrow of the constitution, compelled him to become an oppositionist. He then retired for a time from public life, and resigned his chair, but in 1862 he was reappointed. In 1869, he was returned to the corps législatif by the first circumscription of Seine-et-Oise; and, in 1871, to the assembly for the department of Seine-et-Oise. In 1875, he was elected by the assembly one of the 75 life-members of the new senate.

His principal writings are his translations of Aristotle's works—*Politique d'Aristote* (Paris, 1837); *De la Logique d'Aristote* (1838); *La Logique d'Aristote*, translated into French for the first time (1839–44, 4 vols.); *Psychologie d'Aristote, Traité de l'âme* (1846); *De l'Ecole d'Alexandrie* (1845); *Rapport sur la Comparaison de la Philosophie Morale et Politique de Platon et d'Aristote, avec les Doctrines des plus grands Philosophes Modernes* (1854); *Des Védas* (1854); *Du Bouddhisme* (1855). An enlarged edition of this last, with an account of Buddhism in Ceylon at present, was published in 1860.

BARTHEZ, Paul Joseph, one of the most learned physicians of France, son of a distinguished engineer, b. in Montpellier, 11th Dec., 1734. After serving as an army physician, he founded at Montpellier a medical school, which rose to a high European reputation. His *Nouveaux Elements de la Science de l'Homme* (Montpell. 1778; 2d ed., 2 vols., Par. 1806), in which he set forth a system founded on dynamical principles, was translated into most of the languages of Europe. He became, in 1785, titular chancellor of the university of Montpellier; and consultations with him on serious cases were sought from all parts of the civilized world. The revolution deprived him of the greater part of his property and his places, and compelled him to leave Paris; but Napoleon recalled him, and heaped honors and dignities upon him in his old age. He died in great suffering, after an operation for stone in the bladder, on 15th Oct., 1806. Of his numerous writings, the following deserve special mention: *Nouvelle Mécanique des Mouvements de l'Homme et des Animaux* (Carcassonne, 1798); *Traitement des Maladies Gouteuses* (2 vols., Par. 1802; new ed., 1819;) and *Consultation de Médecine* (2 vols., Par. 1810.—See Lordat, *Exposition de la Doctrine Médicale de Barthez, et Mémoires sur la Vie de ce Médecin* (1818).

BARTHOLIN, the name of a Danish family distinguished for learning and authorship, and the members of which have filled many important offices, especially in the university of Copenhagen. Kasper B., b. 12th Feb., 1585, at Malmö, where his father was a minister, studied theology and philosophy at Rostock and Wittenberg, and afterwards studied medicine. In the year 1610, he was made doctor of medicine at Basle. He practiced for some time in Wittenberg, and in 1613 accepted an invitation to be professor of the Greek language and of medicine at Copenhagen, where, in 1624, he became professor of theology. He died at Sora in 1629. His *Institutiones Anatomicæ* (Wittenb., 1611, and often reprinted), which were translated into the German, French, English, and oriental languages, served in the 17th c., in many universities, as a text-book for prelections. Of his sons, who are all known in the learned world, the following especially deserve to be mentioned: the orientalist, Jacob B., b. 1623, d. at Heidelberg, 1653, known as the editor of the cabalistic works, *Bahir* and *Majan Hachochma;* and Thomas B., equally celebrated as a philologist, naturalist, and physician, who was b. 20th Oct., 1616. He became, in 1647, professor of mathematics, and in 1648 professor of anatomy, at Copenhagen; demitted these offices in 1661, and thereafter lived in retirement upon his estate of Hagestad. In 1670, the king appointed him his physician in ordinary, which situation he filled till his death, 4th Nov., 1680. He enlarged the new edition of his father's anatomy (Leyd., 1641; often reprinted) with a mass of new observations. Besides many other valuable anatomical and medical works, his works on biblical and other antiquities, and on natural philosophy, are particularly worthy of notice. He was one of the most learned and studious of physicians, and warmly defended Harvey's doctrine of the circulation of the blood. His son, Kasper B., b. 1654, d. 1704, was likewise an accomplished anatomist; and another son, Thomas B., b. 1659, d. 1690, is the author of a standard work on northern antiquities—the *Antiquitatum Danicarum Libri Tres* (Copenh., 1689); also of *De Causis Contemptæ a Danis adhuc gentilibus Mortis.*

BARTHOLOMEW, a co. in s.e. Indiana, intersected by the Jeffersonville, Madison, and Indianapolis railroad; 375 sq.m.; pop. '79, 21,133; level in the e. and hilly in the w.; produces cereals, butter, and wool. Co. seat, Columbus.

BARTHOLOMEW, Saint, one of the twelve apostles, supposed to be the same person as Nathaniel. He was a native of Galilee, but nothing authentic is known regarding his life and labors. According to the traditionary record of Eusebius, he carried Christianity

into India; Chrysostom speaks of him as a missionary in Armenia and Asia Minor, while a still later legend declares that he was crucified at Albania Pyla, the modern Derbend, a town on the Caspian sea. The relics of St. B. "appeared" at Rome in 983 A.D., and are preserved there in the church bearing his name. The Roman and Anglo-Catholic churches hold a festival in his memory on the 24th Aug.; the Greek church, on the 11th June. The primitive church possessed an apocryphal gospel under his name, but it is now lost.

BARTHOLOMEW, ST., a Caribbean island, bought by Sweden in 1785 from the French West India company, and acquired again by France through purchase in 1878. It lies about 30 m. to the n. of St. Kitts, in about 17° 40′ n. lat. and 63° e. long. With an area of only 35 sq.m., St. B. contains about 2900 inhabitants. The soil is fertile, though, as is generally the case in the group, fresh water is scarce. Like most of its neighbors, St. B. is difficult of access, its only harbor (Le Carenage) being on its w. side, near the chief town, Gustavia.

BARTHOLOMEW, EDWARD SHEFFIELD, 1822–58; b. Conn. He was first a dentist, then a painter, and lastly a sculptor. Among his productions are "Youth and Age," "The Shepherd Boy," "Ganymede and the Eagle," "Eve after the Fall," and a monument to Charles Carroll.

BARTHOLOMEW BAYOU, a channel or outlet beginning in Arkansas and running in a very crooked course to Washita river in Louisiana; navigable 200 m. for steamboats.

BARTHOLOMEW FAIR, formerly held at West Smithfield, London, but discontinued since 1855. The charter of this fair was granted by Henry I., in 1133, to a monk named Rayer or Rahere, who had been his jester, and had founded the church and priory of St. Bartholomew, with an hospital attached. The fair was held annually at the festival of St. Bartholomew (Aug. 24, old style), and, like all ancient fairs, was originally connected with the church, under whose auspices miracle-plays (q.v.), founded on the legends of saints, were represented, which gave place to mysteries, and these again to moralities; afterwards, profane stories were introduced—the origin of the modern English drama. After the opening of the fair, it was customary anciently for wrestlers to exercise their art. Wild rabbits were hunted for sport by the mob, and the scholars from the different London schools met at the priory for disputations on grammar and logic, and to wrangle together in verse. In the first centuries of its existence, B. F. was one of the great annual markets of the nation, and the chief cloth-fair of the kingdom. The clothiers of England and the drapers of London had their standings, during the fair, in the priory church-yard. A peddler's court, or court of *pie poudre* (see PIEPOWDER COURT), was held within the priory gates, for debts and contracts, before a jury of traders formed on the spot, at which the prior, as lord of the fair, presided by his representative or steward. In 1445, four persons were appointed by the court of aldermen as keepers of the fair and of the court of *pie poudre*, the city being thus in that court represented as joint lord of the fair with the prior. As the fair prospered, its chief articles of traffic were, in the first instance, cloth stuffs, leather, pewter, and live cattle; while it was rendered attractive to the crowds that attended it by a variety of popular amusements. All manner of shows, exhibitions, theatrical booths, etc., thronged the fair; and tumblers, acrobats, stilt-walkers, mummers, mountebanks, and merry-andrews resorted to it in great numbers. On the suppression of the religious houses, the priory was disjoined from the hospital, and the latter, on 27th Dec., 1546, was, by Henry VIII., transferred to the corporation of London, a new hospital being established on the site of the former. The priory was purchased for £1064, 11*s.* 3*d.* by Sir Richard Rich, chancellor of the court of augmentations, afterwards lord chancellor under the title of lord Rich, and became his town-house. Towards the close of the 16th c., streets of houses began to be built on the site of the cloth-fair, a name which is still retained. In 1593, the keeping of the fair was, for the first time, suspended by the raging of the plague. The same thing happened in 1603, in 1625, in 1630, in 1665, and in 1666. At this fair, foreigners were at first licensed for three days, and the city freemen as long as they would, which was six or seven days. In 1661, after the restoration, the fair lasted for 14 days or more. In 1685, it was leased by the city to the sword-bearer. After this period, it began to decay as a place of trade. In 1691, the continuance of the fair was limited to three days, besides the proclamation day. In 1701, it was represented as a nuisance. In 1750, it was again limited to three days. By the alteration of the calendar in 1752, the fair, in the following year, was, for the first time, proclaimed on 3d September. In 1798, the question of abolishing the fair was discussed by the corporation. It had long ceased to be a place of traffic, and was only considered as a haunt of amusement, riot, and dissipation. The fair had latterly been attended only by the keepers of a few gingerbread-stalls; and in 1839, measures were first seriously adopted for its suppression. In 1840, the exhibitions were removed to Islington. Wild-beast shows were allowed, but dwarfs and giants were excluded. In 1850, the last proclamation by the lord mayor took place, and in 1855, the once famous B. F. came to an end. An octavo volume, entitled *Memoirs of Bartholomew Fair,* by Henry Morley, was published in London in 1859.

BARTHOLOMEW'S (ST.) **DAY** (Fr. *La St.-Barthélemy;* Ger. *Bartholomäusnacht*, i.e., Bartholomew's night, or *Bluthochzeit*, i.e., blood-wedding), the appellation given to the massacre of the Protestants in Paris on the night of St. B. D., between 24th and 25th Aug., 1572. After the death of Francis II. in 1560, Catharine de' Medici (q.v.), as regent for her son, Charles IX., a minor, in order to annoy the Catholic party of the duke Francis of Guise (q.v.), had granted an edict of toleration to the Reformed, at whose head was the prince of Condé. Both parties took up arms, and there ensued a war which lasted for eight years, the cruelties of which, through mutual exasperation, are almost incredible. The duke Francis of Guise was murdered by an assassin, and the prince of Condé was taken prisoner in the battle of Jarnac, in 1569, and shot. The young prince Henry of Bearn, afterwards king Henry IV., a nephew of Condé, then became leader of the Reformed, along with admiral Coligny (q.v.). It was not till the strength of both sides was exhausted, that the peace of St. Germain-en-Laye was concluded in 1570, whereby the Reformed obtained the free exercise of their religion. Catharine de' Medici now expressed much friendliness towards the Reformed, and even endeavored to lull them into negligence by the marriage of the youthful Henry of Bearn with her daughter Margaret, 18th Aug., 1572. Admiral Coligny was drawn to Paris, and the king not only made him costly presents, but gave him an important office in the council of state. However, all this was only the basest hypocrisy. When, by means of the marriage of prince Henry, the most eminent of the Reformed had been allured to Paris, admiral Coligny was wounded by a shot from a window of the palace on 22d Aug., 1572. The king, indeed, hastened to him, and swore to avenge him; but, on the very same day, the king was persuaded by his mother that the admiral sought his life. "By God's death!" he exclaimed, "let the admiral be slain, and not him only, but all the Huguenots, till not one remain that can give us trouble!" That night, Catharine held a council, and appointed St. B. D. for carrying into effect the long-contemplated massacre. After Coligny had been murdered, a bell in the tower of the royal palace, at the hour of midnight, gave the signal to the assembled companies of citizens for a general massacre of the Huguenots. The king himself fired from his palace upon those that were fleeing past. The prince of Condé and the king of Navarre only saved their lives by going to mass, and appearing to conform to the Catholic church. The provinces were at the same time summoned to similar slaughter; and although in some of them the officials were ashamed to publish the murderous commands which had been transmitted to them, there were found bloodthirsty fanatics enough, who perpetrated the greatest horrors for several weeks together in almost all the provinces, so that it was reckoned that 30,000 (some authorities make the number 70,000) persons were murdered. The pope celebrated the events of St. B. D. by a procession to the church of St. Louis, a grand *Te Deum*, and the proclamation of a year of jubilee. Many of the Huguenots fled to pathless mountains and to La Rochelle, to which the duke of Anjou laid siege. Upon receiving intelligence, however, that he had been elected king of Poland, he made an arrangement on July 6, 1573, according to which the king granted to the Huguenots an amnesty, and the exercise of their religion in certain towns.

BARTHOLOMEW'S (ST.) **HOSPITAL**, Smithfield, London, was originally a part of the priory of St. Bartholomew, founded in 1102 by Rahere, the first prior. At the dissolution of the religious houses, it was founded anew by Henry VIII., and the endowment has been subsequently enlarged from various sources, public and private. The hospital contains more than 600 beds, and affords relief to 70,000 patients annually. There is a medical school attached. The revenues are large and ample.

BARTIZAN, a small stone closet, thrown out upon corbels over doorways, and on other parts of mediæval castles, generally for defense, but sometimes only for convenience to the inmates and defenders.

BARTLETT, ELISHA, 1805–55; b. R. I.; a physician, graduated at the medial department of Brown university; lecturer on pathological anatomy; professor in Transylvania (Ky.) college, and in the universities of Maryland and New York, and professor of materia medica, etc., in the New York college of physicians and surgeons. He wrote *Essay on the Philosophy of Medical Science*, *Fevers of the United States*, and a volume of verses from subjects in Dickens' novels. He was also editor of the *Monthly Journal of Medical Literature*.

BARTLETT, ICHABOD, 1786–1853; b. N. H.; a lawyer of Portsmouth, N. H., educated at Dartmouth; was in the state legislature and in congress. He was a conspicuous forensic opponent of Daniel Webster and Jeremiah Mason.

BARTLETT, JOSEPH, 1762–1827; b. Mass.; a lawyer of Massachusetts, graduate of Harvard; author of *The New Vicar of Bray*, and other satirical verses. His life was remarkable. He visited England, fell to gambling, was put in prison, wrote a play to secure his release, and went upon the stage. He came back with a great quantity of goods procured on credit, and was wrecked on cape Cod. Then he went into law business and politics, and was elected to the legislature.

BARTLETT, JOSIAH, 1729–95; b. Mass.; a self-educated physician, beginning practice in New Hampshire, where he successfully introduced the use of Peruvian bark. He was in the legislature from 1765 until the revolution. He was a member of the

committee of safety, a justice of the peace, colonel of a regiment, delegate in congress, the first member to vote for the declaration of independence, and the first (after John Hancock, the president) to sign that document. He was judge of the common pleas, justice of the supreme court, and chief justice. He was a member of the state convention called to adopt the federal constitution, and the first governor of New Hampshire under its first constitution. He was president of the New Hampshire medical society, and always the friend and patron of learned men.

BARTLETT, SAMUEL COLCORD, D.D., LL.D.; b. N. H., 1817; graduate of Dartmouth, and of Andover theological seminary; professor of intellectual and moral philosophy in Western Reserve college, and of Biblical literature in Chicago theological seminary; Congregational pastor in various places; at present (1880) president of Dartmouth college. He is known as a vigorous writer in support of the old forms of doctrine. He has traveled in the east, and has published, besides many essays, *Sketches of the Missions of the American Board*, *Life and Death Eternal*, and special articles for Smith's *Dictionary of the Bible*.

BARTLETT, WILLIAM, 1748–1841; b. Mass.; a philanthropist who accumulated a large fortune in trade. He contributed $30,000 toward the founding of Andover theological seminary, and distributed more than a quarter of a million to mission and other benevolent objects.

BARTLETT, WILLIAM FRANCIS, b. Mass., 1840; graduated at Harvard; served with conspicuous honor in the civil war from private to brevet maj.gen. of volunteers; lost a leg at the siege of Yorktown; was wounded at Port Hudson, and the battle of the Wilderness, and once more while leading an assaulting column near Petersburg, when he was taken prisoner. He died, greatly lamented, Dec., 1876.

BARTLETT, WILLIAM HENRY, an artist and popular writer, was born at Kentish Town, London, on the 29th Mar., 1809. He was a pupil of the eminent architectural antiquary, Mr. John Britton, of London, and during his apprenticeship displayed more than ordinary talent for drawing, which was fostered by his master sending him into many of the most interesting counties in England to make sketches from nature. Mr. Britton afterwards employed him to make drawings for his *Cathedral Antiquities* and also for his *Picturesque Antiquities of English Cities*. Subsequently B. visited the continent, the Holy Land, and America several times, on each occasion enriching his portfolio with innumerable interesting scenes. No fewer than 19 quarto volumes, containing about 1000 engravings from his sketches and letterpress from his own pen and those of his fellow-travelers, Dr. W. Beattie, N. P. Willis and Miss Pardoe, were devoted to these countries. Several other volumes, of which he was the sole author as well as artist, have also been published. Some of the books had a wonderful success, especially those on Swizerland, the Holy Land, and Egypt. B. died on the voyage from Malta to Marseilles on Sept. 25, 1854. He had been revisiting Palestine, and the materials he had collected were published under the title *Jerusalem Revisited*.

BARTLETT is also the name of several American authors, the most eminent of whom is John Russell B., born at Providence, R. I. (U. S.), in Oct., 1805. He was employed by the United States government, in 1850–53, as a commissioner for determining the Mexican boundary line, and, in 1854, published an account of his explorations and adventures, etc., in that capacity. In 1855, he became secretary of state of Rhode Island. He is also the author of *The Progress of Ethnology*, a popular *Dictionary of Americanisms*, *Bibliography of Books Relating to the Civil War*, etc.

BARTOL, CYRUS AUGUSTUS, D.D., b. Me., 1813; graduate of Bowdoin college, and of Cambridge divinity school, and became a Unitarian preacher, pastor of the West church, in Boston. In doctrine he ranks among the radicals of his denomination; in style he is clear and picturesque. He has published *Discourses on the Christian Spirit and Life*, *Christian Body and Form*, *Pictures of Europe*, *Radical Problems*, *The Rising Faith*, and many essays.

BARTOLI, DANIELE, 1608–85; a native of Ferrara, educated a Jesuit, and commissioned to write a history of the order, which he did in an elaborate work, treating especially of Christianity in Japan, and other parts of the east. He also wrote a history of the English Roman Catholics, the life of Loyola, several other biographies, books on religion and morals, on physical phenomena, grammar, etc.

BARTOLI'NI, LORENZO, a celebrated Italian sculptor, was b. at Vernio, in the n. of Tuscany, in 1777. Circumstances brought him to Paris while still a young man, where he practiced his art for some time with very little pecuniary success; but at length, having obtained an academy prize for a bass-relief of Cleobis and Biton, he was suddenly ushered into notice and prosperity. Several influential persons patronized him, such as Denon and Regnauld de St. Jean d'Angely. Through the first, he obtained a commission to execute one of the bass-reliefs in the hall of the Vendôme palace, and also the bust of Napoleon over the door of the institute of France. Napoleon himself gave him a multitude of orders, many of which, unfortunately, were never executed. In 1808, the emperor sent him to Carrara, to establish a school of sculpture. Here he remained till 1814, when he accompanied his imperial master to Elba. After the battle of Waterloo, he repaired to Florence, where he was subsequently appointed director of the

sculpture department in the academy of the fine arts, an office he retained till his death in 1850. Bartolini was a very prolific artist. Besides the works already mentioned, Bartolini executed busts of Cherubini, Mehul, Madame Regnauld, a magnificent statue of Napoleon I. (now in America), several exquisite sepulchral monuments, such as that of lady Stratford Canning in the cathedral of Lausanne, and various groups, the most celebrated of which are his "Charity," and "Hercules and Lycus." In England and France, his style is in general greatly esteemed; in Germany, it is less highly thought of. His figures are characterized by their truthfulness of proportion and classic repose, though they also possess a remarkably life-like expression. After Canova, Bartolini is reckoned the most distinguished Italian sculptor of modern times.

BAR'TOLO, or BAR'TOLI, TADDEO DI, 1390–1414; an Italian painter whose works are found at Padua, Pisa, and Volterra, with some remarkable frescoes in the chapel of the plaza at Sienna.

BARTOLOMEʻO, SAN, a t. of Italy, in the province of Benevento, with a pop. of 5400.

BARTOLOMMEʻO, FRA. See BACCIO DELLA PORTA, *ante*.

BARTOLOZ'ZI, FRANCESCO, an eminent engraver, was b. in Florence about 1730. After practicing his art under Wagner of Venice, he went to Rome, where he executed his admired plates from the life of St. Nilus. He was afterwards commissioned by Mr. Dalton, librarian of George III., to engrave a series of drawings by Guercino, and was induced by the same gentleman to settle in England. Here Bartolozzi produced his spirited and highly finished engravings of the "Virgin and Child" after Carlo Dolci, and "Clytie" after Annibale Carracci, which entitle him to occupy the front rank in his profession. He also engraved numerous specimens of the works of his friend Giovanni Cipriani, of Michael Angelo, Cantarini, Cortona, etc., with equal truth and effect. Bartolozzi likewise enriched alderman Boydell's Shakespeare gallery with many fine engravings. In 1802, he received a flattering invitation from the prince regent of Portugal, to take the superintendence of a school of engravers at Lisbon, whither he repaired three years afterwards, in his seventy-fifth year, and there resided until his death in 1818. He was the grandfather of Madame Vestris, the celebrated comedian.

BAR'TOLUS, Osso, or BARTOLUS DE SAXO FERRATO, 1314–57; professor of civil law in the university of Perugia, and the most famous master of the dialectical school of jurists. He won great reputation by his lectures and writings; among the latter, treatises *On Procedure*, *On Evidence*, and *Commentary on the Code of Justinian*. His magnificent monument in the church of San Francisco bears simply his name.

BARTON, a co. in central Kansas; 1322 sq.m.; pop. '78, 8251; in '80, 10,768. The co. is intersected by the Arkansas river, and by the Atchison, Topeka and Santa Fe railroad; surface undulating and soil productive. Co. seat, Great Bend.

BARTON, a co. in Missouri on the Kansas border; 600 sq.m.; pop. '70, 5087; in '80, 10,332. It is chiefly forest and prairie, with fertile soil, producing corn, wheat, and live stock. Coal and limestone are found. Co. seat, Lamar.

BARTON, BENJAMIN SMITH, 1766–1815; a native of Pennsylvania; educated at Philadelphia, and in Germany; graduated at Göttingen; professor of natural history, botany, and materia medica in Pennsylvania college. Besides many papers in the philosophical and medical journals, he published *Observations on Some Parts of Natural History*, *New Views of the Origin of the Tribes of America*, *Elements of Botany*, *Collections towards a Materia Medica of the United States*, and other medical works.

BARTON, BERNARD, an English poet, b. 31st Jan., 1784, in London. His parents were members of the society of Friends, to the tenets of which body B. adhered through life. In 1810, he became clerk to a banking house at Woodbridge, in which situation he continued until within two years of his death. His first poetical efforts, published in 1812 under the title of *Metrical Effusions*, brought him into correspondence with the poet Southey. *Poems by an Amateur* (1818), and *Poems* (Lond., 1820), increased his reputation and gained him the friendship of Lamb and Byron. *Napoleon and other Poems* appeared in 1822, and was followed within five years by several other productions. All the poems of B. are pervaded by pious sentiment, and some passages display much natural tenderness and religious fervor; but he is, on the whole, rather a fluent, pleasant versifier than a poet. So early as 1824, a reading club founded by him in Woodbridge collected the sum of £1200 sterling, and presented it to him. Some years before his death, he received, through sir Robert Peel, a pension of £100 sterling. In addition to the works mentioned, he published *Fisher's Juvenile Scrap-book* (Lond., 1836), *The Reliquary* (Lond., 1836), and *Household Verses* (Lond., 1845). After his death, which took place suddenly, 19th Feb., 1849, his daughter published *Selections from the Poems and Letters of Bernard Barton* (Lond., 1849).

BARTON, CLARA, b. Maine. She was a teacher in early life, and founder of various free schools in New Jersey. In 1854, she had a clerkship in Washington, but resigned at the beginning of the war of the rebellion and went into hospital service. After peace she originated and carried on at her own cost a systematic search for missing soldiers. Going to Europe for her health, she was assistant to the grand duchess of Baden in estab-

lishing hospitals in the Franco-German war, followed the German army, and was honored with the golden cross of Baden and the iron cross of Germany.

BARTON, ELIZABETH, commonly called "the holy maid of Kent," a wretched creature, subject to spasmodic nervous affections, during which she gave utterance to incoherent exclamations and phrases. About the year 1525, she was servant in a tavern at Aldington, in Kent; and the cunning priest of the parish seeing her in her paroxysms, on the strength of her misfortune conceived the idea of presenting her to the world as a prophetess. Under his directions, she played her part so well that not only the common people, but even men of intellect and education like sir Thomas More, and Barham, the archbishop of Canterbury, were deceived by her. The former, however, afterwards recognized her true character. She became a nun, and when, in 1532, Henry VIII. quarreled with the court of Rome, she was induced to denounce loudly the king's separation from his first wife, and his marriage with Anne Boleyn, and even to prophesy his death. Being arrested by the king's command, along with her accomplices, she made before the judges a confession, which was afterwards publicly repeated before the people, of the fraud which had been perpetrated, and was sentenced to ecclesiastical penance and to imprisonment. She was afterwards accused of high treason, and executed along with some of her accomplices in 1534.

BARTON, WILLIAM, 1747–1831; a native of Rhode Island; and a col. in the revolution. On the night of July 20, 1777, he led a small party across Narragansett bay, passed unobserved by three British war vessels, and near Newport captured the English gen. Prescott. For this act congress gave him a sword, a colonel's commission, and a tract of land in Vermont. He was for many years in prison for debt in Vermont, but was released through the influence of gen. Lafayette, who paid the claim on which he was held.

BARTON BEDS, a group of strata, composed of clay and sand, and forming part of the middle eocene formation, included in the Bagshot series (q.v).

BARTON-ON-HUMBER, a t. in n. Lincolnshire, on the s. side of the Humber, 6 m. s.w. of Hull. It is a very ancient place, having been one of the chief ports of the Humber before the foundation of Hull. It was once surrounded by a rampart and fosse, as a protection against the incursions of the Danes and Saxons. The ferry across the Humber, on the great road from London to Hull, used to be here; but the London and Hull inland traffic has now been diverted from B. by the steam ferry at New Holland, 6 m. below Barton. The chief manufactures are ropes, sacking, bricks, tiles, pottery, and whiting. There are quarries of chalk and oolite. The tower of St. Peter's church, which was built about the time of the conquest, has both round and pointed arches; and, with the part of the building to the w., constitutes one of the few existing examples of undoubted Anglo-Saxon architecture. St. Mary's church is a handsome structure of the 14th century. Pop. '71, 4332.

BARTON'S BUTTONS, exceedingly minute lines engraved on metal by a dividing engine, which produce a surface reflecting various colors. These fine lines are stamped from dies on buttons, etc., which rival gems in brilliancy. John Barton was the inventor.

BARTOW, a co. in n.w. Georgia, intersected by the head waters of the Coosa river, and by the Western, and Atlantic and Rome railroads; 550 sq.m.; pop. '76, 16,566—6774 colored; in '80, 18,694. It is hilly, with fertile soil, producing grain, cotton, and wool; has mines of copper, lead, marble, and limestone. Co. seat, Cartersville.

BARTRAM, JOHN, 1701–1777; a Pennsylvanian farmer, who became, according to Linnæus, "the greatest natural botanist in the world." He visited many sections of the present United States, collecting trees and plants for European gardens, for which the botanists of the time repaid him in books and apparatus. On the Schuylkill near Philadelphia he established the first American botanical garden, and was a member of several foreign societies. He published *Description of East Florida, with a journal.*

BARTRAM, WILLIAM, 1739–1823; a native of Pennsylvania, son of John, and like him a botanist, though he declined a professorship on account of imperfect eye-sight. He settled in Florida and wrote *Travels Through North and South Carolina, East and West Florida, and the Cherokee Country,* and *Observations on the Creek and Cherokee Indians.* He made the most comprehensive list of American birds, previous to that of Wilson, with whom he was a co-laborer.

BARTSCH, JOHANN ADAM BERNHARD, VON, 1757–1821; a German engraver of superior acquirements, member of the academy of fine arts, and director of the imperial collection of engravings; author of *La Peintre-graveur,* in 21 vols., a *Catalogue of the works of Rembrandt,* and other catalogues. He produced more than 500 plates of his own.

BA'RU, a fine woolly substance found at the base of the leaves of the *saguerus saccharifer* (also called *arenga saccharifera*), one of the most valuable sago-palms of the Indian archipelago. It is much employed in calking ships, in stuffing cushions, and for other similar purposes.

BA'RUCH (i.e. the blessed), the son of Neriah, was the person to whom the prophet Jeremiah dictated his oracles. During the siege of Jerusalem by Nebuchadnezzar, both he and the prophet were, by their own countrymen, shut up in a narrow prison, but

obtained from the conquerer freedom and permission to choose their own residence. B. remained for some time in Palestine, but afterwards accompanied Jeremiah to Egypt. His subsequent history is unknown. An apocryphal work in the Greek language has come down to us under his name—viz., the book of B., which contains words of comfort for the Israelites, and predicts the rebuilding of Jerusalem. There is usually appended to it, as chapters vi. and vii., a letter—also apocryphal—of the prophet Jeremiah to the exiles in Babylon.

BAR'WOOD. See CAMWOOD.

BARYE', ANTOINE LOUIS, b. 1795; a French sculptor, and teacher of the art of designing subjects in natural history. He produced allegorical, mythological, and historical works; statues of public men; "Amazon" and "Angelica," modeled from his two daughters; and many other figures remarkable for accurate physiological construction. He also produced many figures of animals in action, such as a lion crushing a boar, and a tiger killing a goat. He was a chevalier and officer of the legion of honor, member of the academy, etc.

BARY'TA, or BARY'TES, or Oxide of Barium (q.v.)—symbol BaO—is the earth present in the minerals *witherite* (carbonate of B.) and *heavy spar* (sulphate of B.). It may be prepared in several ways: 1. By acting upon the carbonate of B. ($BaOCO_2$) by nitric acid (NO_5), which causes the disengagement of the carbonic acid (CO_2), and the nitric acid combining with the B. forms the nitrate of baryta ($BaONO_5$). On evaporating the latter substance to dryness, and igniting the residue, the nitric acid volatilizes, and leaves the baryta (BaO). 2. Another mode of preparing the same substance is to act upon a solution of sulphuret of barium (BaS) by the black oxide of copper (CuO), when an interchange of elements occurs, the sulphur uniting with the copper, producing sulphuret of copper (CuS), and the oxygen with the barium, forming B. (BaO), which remains dissolved in the water, and, on evaporation, deposits crystals in the hydrated condition (BaO, HO). B. belongs to the group of alkaline earths, and has the property of acting like an alkali (q.v.) on coloring matters. It has a very harsh taste, is highly caustic, and is very poisonous. A solution of B. is used by the chemist as the best indication of the presence of carbonic acid gas in the atmosphere, for when a plate or other vessel containing the solution is exposed to the air, the carbonic acid floating across the surface combines with the B., and forms a film of white carbonate of baryta (BaO,CO_2). Otherwise, B. possesses little interest, as it is not put to any commercial or medicinal use. The compounds of B. are, however, of considerable importance. The *sulphate of B.* ($BaOSO_3$), otherwise called *ponderous* or *heavy spar*, is found in the mineral kingdom, diffused in fissures or cracks, passing through other rocks, especially in Cumberland, Durham, and Westmoreland, and in the island of Arran. At the latter place, an extensive mine of heavy spar has been worked for many years.

In its native condition, the sulphate of B. occurs of a crystalline texture, is sometimes found pure and white, but generally presents a flesh-red color, from the red oxide of iron (rust) incorporated in it. The rust can be got quit of by reducing the sulphate of B. to a fine powder under rollers or traveling-wheels, and subjecting the pulverized material to the action of dilute sulphuric acid, which dissolves the red oxide of iron, and leaves the sulphate of B. as a white dense powder. The principal use of *heavy spar* is as a pigment under the name of *permanent white;* but having little opacity, it cannot be employed by itself, but only when mixed with ordinary white lead. When added to the latter, however, it must be regarded as an adulteration, for the little opacity it possesses renders it of service only as an increaser of the bulk of the white lead. Several mixtures of sulphate of B. and white lead are manufactured, and are known in commerce. *Venice white* contains 1 part sulphate of B., and 1 part white lead. *Hamburg white* contains 2 parts sulphate of B., and 1 part white lead. *Dutch white* contains 3 parts sulphate of B., and 1 part white lead. The native sulphate of B. has been employed by the celebrated potter Wedgwood in the manufacture of jasper ware, and for the formation of white figures, etc., on colored jars and vessels. The *carbonate of B.* found native as *witherite*, and the *nitrate of B.*, have been previously referred to in this article and that on BARIUM.

BAR'YTON (Viol di Bardoni), an old chamber-instrument, somewhat like the viol di gamba in tone: had a broader finger-board, with 7 gut-strings, while under the neck there were 16 strings of brass wire, which were touched with the point of the thumb, to produce a sound, while the gut-strings were acted on by a bow.

BARYTON, that species of the human voice which lies between the bass and the tenor, the tone-character of which is more allied to the bass. The compass of a B. voice is from but the principal notes of the voice are from ; and these should possess the energetic character of a bass voice, and, above all, be produced from the chest, excepting perhaps the highest. In former times, the music for this species of voice was written on a stave with the F clef placed on the 3d line, thus:

BAS, or **BATZ**, a small island in the English channel, belonging to France, and situated off the n. coast of the department of Finisterre. Its length is about 3 m., and its breadth 2. It has a light-house, in lat. 48° 45′ n., and long. 4° 1½′ w., on an elevation 223 ft. above the sea, and is defended by 2 forts and 4 batteries. Pop. above 1000, whose chief occupation is fishing.

BASALT', strictly a variety of trap rock (q.v.), although some writers use the words as synonymous. It is composed of the same materials as greenstone (q.v.), and other varieties of trap, viz., hornblende and felspar, with a small quantity of iron; but these exist in a state of finer division than in greenstone, showing that the crystalline action has been stopped at its commencement by the more rapid cooling of the mass. To this is owing its sharp conchoidal fracture and its hardness. As the hardness is frequently accompanied with tenacity, it makes B. a valuable material in the making of roads. It is of a more uniform dark-gray color, approaching to black, than the other varieties of trap.

A rock of a similar appearance and structure occurs as a variety of lava, in volcanic districts. This lava B. differs from the older trap B. in the form which the silicates of magnesia and lime assume when crystallizing. In the newer rocks, they appear as augite; in the older, as hornblende. These two minerals can scarcely be distinguished by their chemical composition, the different formulas given by mineralogists being the result of the presence, in the specimen analyzed, of accidental ingredients or impurities. The slightly differing crystallographic angle has been accounted for by the supposed more speedy cooling of the volcanic rocks. Rose, indeed, has shown that the hornblende of melted greenstone, in recooling, crystallizes as augite; and we have observed that the same change has taken place in specimens of recrystallized B., obtained from works which existed lately at Birmingham for converting this rock into an opaque glass for various economic uses.

The remarkable columnar structure which B. frequently assumes, is its most striking characteristic. The columns vary in the number of their angles from three to twelve; but they have most commonly from five to seven sides. They are frequently divided transversely by joints at nearly equal distances. The direction of the columns is always at right angles to the greatest extension of the mass, so that when B. occurs as a bed, either overlying, or interstratified with the regular strata, the columns are perpendicular, while they are horizontal when the B. exists as a dike.

The columnar structure was at first believed to be owing to a modification of the crystalline force. Such a supposition was favored by the external form of the columns; but the total absence of internal structure showed that the explanation must be sought elsewhere. In 1804, Mr Gregory Watt propounded a theory of the origin of the structure, ascribing it to the pressure of numerous spheres on each other, during the process of cooling, such spheres being produced in planes of refrigeration or absorption. They increase by the successive formation of external concentric coats, until their growth is prevented by the contact of neighboring spheres; and as in a layer of equal-sized spheres, each is pressed on by six others, the result is that each sphere will be squeezed into a regular hexagon. Watt published this theory as the result of his celebrated observations on the cooling of a mass of molten basalt, in which he noticed the production of numerous spheroids, having a radiate structure. Many greenstones, in weathering, present such a structure, giving often to the rock the appearance as if it were composed of a mass of cannon-balls, and Watt's experiments satisfactorily explain this phenomenon; but they will not go further. Anxious, however, that they should throw some light on the structure of basaltic columns, he manages it by the following remarkable assumption: "In a stratum composed of an indefinite number in superficial extent, but only one in height, of impenetrable spheroids, with nearly equidistant centers, if their peripheries should come in contact in the same plane, it seems obvious that their mutual action would form them into hexagons; and if these were resisted below, and there was no opposing cause above them, it seems equally clear that they would extend their dimensions upwards, and thus form hexagonal prisms, whose length might be indefinitely greater than their diameters. The further the extremities of the radii were removed from the center, the greater would be their approach to parallelism; and the structure would be finally propagated by nearly parallel fibers, still keeping within the limits of the hexagonal prism with which their incipient formation commenced; and the prisms might thus shoot to an indefinite length into the undisturbed central mass of the fluid, till their structure was deranged by the superior influence of a counteracting cause." Unfortunately, such dreams too often meet with more acceptance than the drier deductions from observed facts; which must, however, in the end, form the only basis of all geologic science. But there is no occasion here to urge even the most imaginative to resort to hypothesis, for the formation of columns in other substances than B. is quite familiar, and their producing causes evident. In starch, columns having the external prismatic appearance, and the internal earthy structure, are produced simply from the escape of vapor, and consequent shrinking of parts. We have seen singularly regular joints produced in the argillaceous ironstone at Wardie, near Edinburgh, on its exposure on the beach, the contractions forming the columns evidently resulting from the escape of the moisture retained by the bed while it was covered by other strata. The same occurs in beds of fine clay that have been recently exposed. But the most

regular series of columns that have been noticed by us, were produced on bricks which formed the bottom of a public oven. The long-continued and powerful heat to which they had been subjected, though it had not caused fusion, had so affected them as to produce a beautiful series of regular hexagonal prisms. The columns had a diameter of nearly half an inch. Their direction was at right angles to the oven floor. The earthy structure of the brick remained. The columns, in short, were in every respect, except the material of which they were formed, true basaltic columns. It is surely better to look for an explanation of this structure in causes similar to those which have produced the examples adduced, than to find it in such groundless assumptions as are at the foundation of the generally received theory of Watt. The columnar structure of B. seems to have been produced subsequently to the cooling of the mass, by changes in the solid rock, probably from the escape of some volatile matter.

The two best known and most beautiful examples of columnar B. are Fingals Cave, in the island of Staffa, on the west coast of Scotland, and the Giants' Causeway, on the n. coast of Ireland.

BASANTGANJ, a walled t. of India, in the chief-commissionership of Oude, 55 m. n.w. from Allahabad. Pop. 6000, of whom one half are Mussulmans.

BASARJIK, HAJEE-OGLOO-BAZARJEEK (Turkish, "market-town"). One in e. Bulgaria, 25 m. n. of Varna, has 5000 inhabitants, and an annual fair. It was twice taken by the Russians, 1774 and 1810. Another, called TARTAR B., is in the government of Adrianople, on the Maritza; pop. about 5000, one fourth Christians. Trade in rice is the main business.

BASCINET. See HELMET.

BASCOM, HENRY BIDLEMAN, D.D., LL.D., 1790–1850; b. N. Y.; bishop of the Methodist church (south). He was licensed to preach before he was 18 years of age, and began in the Ohio conference; was transferred to Tennessee, and in 1823 was chosen chaplain to congress at the solicitation of Henry Clay. In 1827, he was president of Madison college; 1829–31, agent of the American colonization society, and professor of moral science in Augusta college (Ky.), remaining until 1841; the next year becoming president of Transylvania college (Ky.). He was the writer of the protest of the Southern delegates in the general conference against the action of that body in the case of bishop Andrews, and afterwards a leader in the organization of the southern branch of the church. He was prominent in all questions before the church; was editor of the *Quarterly Review*, and published *Methodism and Slavery*, and a great number of sermons. In the pulpit he was eloquent and impassioned.

BASCOM, JOHN, D.D., LL.D., b. N. Y., 1827; a graduate of Williams college and of Andover theological seminary, and professor of rhetoric in the former. He has published *Political Economy, Treatise on Æsthetics, Elements of Psychology, Science, Philosophy, and Religion*, etc. His style is elaborate, though clear, and his thought profound. He is president of the university of Wisconsin, at Madison.

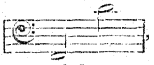
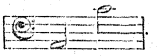
BASE, in heraldry, the lower portion of the shield is called the B.; there is a dexter base, middle base, and sinister base. The *chief* or principal part of the escutcheon is the top. The shield is always supposed to be on the arm of the wearer, and that it is his right and left hands, not those of the spectator, which are kept in view. The *ground* or surface of the shield, on which all the *charges* or figures are depicted, is called the *field*.

IN BASE.—When any figure is placed in the B. part of the shield, it is said to be *in base*.

BASE (Fr. and Ital.), the foot or lower member of a pillar, on which the shaft rests. Of the classical orders, the Doric column alone had no base. The height of the B. is usually about half the lower diameter of the shaft; and it is divided into the *plinth*, or flat projecting square block or blocks, immediately above the ground, and the *mouldings* (q.v.), or fillets, which surround the column, and are usually circular. In the early Norman style, the bases of pillars still retained, from the Romanesque, forms closely resembling the Tuscan order. As Gothic architecture advanced, and emancipated itself from the arbitrary rules by which the classical orders were governed, bases became infinitely varied in detail, though something approaching to the original conception of a strong and firm foundation for the column, adhered to them throughout.

BASE, in chemistry, is a term applied to a compound body, generally consisting of a metal united with oxygen. Thus, the metal potassium (K), when it combines with oxygen (O), forms the B. potash (KO); sodium (Na) and oxygen, the B. soda (NaO); lead (Pb) and oxygen, the B. oxide of lead or litharge (PbO). A distinguishing feature of a B. is that it unites with an oxygen acid, such as sulphuric acid (SO_3) to form a *salt* (q.v.). Thus, the B. potash (KO) combines with sulphuric acid (SO_3) to make the salt sulphate of potash ($KOSO_3$); potash with nitric acid (NO_5) to form the salt nitrate of potash, or niter ($KONO_5$). Occasionally sulphur replaces the oxygen in a base. Thus, the metal potassium (K) unites with sulphur (S) to form the *sulphur* base, sulphuret of potassium (KS), which can unite with a sulphur acid like sulpharsenious acid or orpiment (AsS_3) to make the salt sulpharsenite of potash (KS,AsS_3). The metal half of a B. need not be a simple element, but may be a compound body which, for the time, plays the part of a

simple substance. Thus, the compound ethyl (C_4H_5) can combine with oxygen to form ordinary ether ($[C_4H_5]O$); and the B. thus produced can, in its turn, combine with acids to form salts. A base may be soluble or insoluble in water. Thus, the bases potash (KO), soda (NaO), ammonia (NH_4O), baryta (BaO), strontia (StO), lime (CaO), and magnesia (MgO), are more or less soluble in water; whilst the oxide of iron or rust (Fe_2O_3), the red oxide of lead ($PhbO_3$), the red oxide of mercury (HgO), are insoluble in water, but soluble in acids. See CHEMISTRY.

BASE, or BASS (from *basis*, the foundation), in music, is the deepest or lowest part, by whatever instrument it may be performed. The B., next to the upper part, is the most striking, the freest in its movements, and richest in effect. Its movement downwards is unfettered, unconcealed, and undisturbed, whereas the middle parts are circumscribed and concealed. In respect to harmony, the B. is the most important part in music, containing more frequently the fundamental notes of the chords, while on it is formed that most important and effective figure in music called "organ-point" (q.v.)—B. is also the name of the lowest and deepest quality of the human voice. The compass of a B. voice is generally from , which should all be chest notes, except, perhaps, the highest. The most useful range, however, is from  . In the characteristic use of the B. voice, the old masters were unquestionably the greatest, especially Handel and Bach. The B. voice only begins to show itself at the years of manhood, and is generally a change from the alto voice of a boy.—B. is also the name of an old stringed instrument, with from five to six strings, tuned variously to suit the music, and played with a bow. It was a sort of middle instrument between the contra-bass and violoncello, but is now out of use. Double B. (contra-bass) is the deepest-toned of stringed instruments.

BASE-BALL, GAME OF, is sometimes said to be the national field-game of the United States, holding the same position in this country as cricket in Great Britain; it has, moreover, the advantage of being a more spirited pastime and far more interesting both to players and to spectators. The average time of a base-ball match is from 2 hours to 2½ hours, whereas a cricket match may extend to 3 days, and then remain undecided. Base-ball was founded on the old English game of "rounders," but bears hardly any resemblance to it in its present form. The first regular B. B. society, called the "Knickerbocker club," was founded at New York in 1845. In 1857, the popularity of this game had increased to such an extent that a national association of base-ball players was formed out of the Knickerbocker, Gotham, Eagle, Empire, Baltic, and Harlem clubs of New York; the Putnam, Excelsior, Atlantic, Eckford, and Continental clubs of Brooklyn, and the Union of Morrisania, all of which were founded between 1845 and 1856. Prior to 1857, the club that was the first to score 21 aces, or runs, was declared winner of the game, but the national association decided to award the victory to the club that scored the largest number of runs, after each side had played 9 innings. The war of the rebellion was a serious interruption to all sport of this character, but in 1865, base-ball began to regain its popularity and to be studied as a profession by many who devoted to it their whole time and energy, becoming experts and receiving pay. It naturally followed that base-ball players were classified as either professionals or amateurs, and that the latter could not be expected to play with the same degree of excellence as the former; the amateurs, therefore, broke up the old association and founded, in 1871, the national association of amateur base-ball players. The other class organized the national association of professional base-ball players, which gave way in 1876 to the league association of professional clubs. In the summer of 1874, the Boston base-ball club and the Athletic club of Philadelphia sailed for Europe, to play a series of exhibition matches in England and Ireland, and caused much surprise at their skill in the game of cricket, acquired by their training as base-ball fielders. From 1871 to 1876, the Boston club, called "Red Stockings," held the championship pennant of the league association of professional clubs.

The ground chosen for a game of base-ball should be a clear, level piece of turf, not less than 500 by 300 ft.; a square of 90 ft. is then marked out by locating its diagonals, and a base is placed at each angle; the home base at the upper point, the second base at the lower point; standing on the home base and looking down the ground, the apex of the triangle on the right hand is the center of the first base, and the apex of that on the left hand the center of the third base. Forty-five feet from the front angle of the home base is then to be measured down the diagonal of the square, in order to fix the center of the pitcher's position, which is 6 ft. square. Lastly, the lines which join the home with the first and third bases respectively, are prolonged, and posts, called foul-ball posts, are set on these lines not less than 100 ft. from the centers of the first and third bases. A ball is fairly hit if it first touches the ground, a player's person, or other object, on or in front of the foul-ball lines. There are nine players on a side, and the theory of the game is that one side takes the field and the other side goes to the bat; the positions of those in the field are as follows: The pitcher stands on his square facing the batsman at a distance of 45 ft. from the home base. The catcher stands at an optional distance behind the bats-

man at the home base, and a man is placed near behind each of the other three bases. The short-fielder is between the second and third bases, behind the pitcher, as a general backer up of the in-field. The out-fielders are in the left, center, and right fields, at some distance behind the second base, to catch the balls and return them to the pitcher or the base men. One of the nine generally acts as captain, stationing and giving directions to his men during the game. After the choice of first innings has been settled by a toss, the pitcher delivers the ball to the batsman by a toss, a jerk, or an underhand throw. If the batsman hits the ball and it is not declared a foul by the umpire, he must endeavor to reach the first base, and afterwards, as occasion offers, the second, third, and home bases. But if, before the batsman can reach a base for which he is running, a fielder, holding the ball, touches that base, or the person of the runner; or if the ball, hit by the bat, is caught before touching the ground; or if a foul ball be caught after touching the ground but once; or if, after the batsman has struck at the ball three times in vain, he fails to touch the first base before the ball is legally held there—he is declared out by the umpire. After a batsman has reached the first base he is not compelled to leave it until the next batsman has struck a fair ball. A run is scored when a base-runner reaches the home base after touching the others in numerical order; if three players of the side are out before the runner makes all his bases, he fails to score. The umpire must be thoroughly conversant with the game, and all the minutiæ of the rules. He is the sole arbiter of every point of play; whether pitching, catching, fielding, striking, or running. The catcher's duty is to catch all balls pitched to the batsman. The pitcher holds the most difficult position of the field side. His tactics are to deceive the batsman as to where a ball is coming, and he must be able to catch any balls hit straight at him. The first, second, and third basemen must all be sure catchers, swift and accurate throwers, and good judges of which base to send the ball to, in order to put an opponent out. The right, center, and left fielder must all be sure catchers, good long-distance throwers, and active runners. The ball must weigh not less than 5 or more than 5¼ ozs., avoirdupois; must not be less than 9 or more than 9¼ in. in circumference, and be composed of 1 oz. avoirdupois of vulcanized india-rubber, covered with worsted and leather. The bat must be of wood, a round stick suitable for handling and striking, and 42 in. long. The bases must be 1 ft. square. No game can be scored unless 5 innings have been concluded on each side, and no game can be drawn unless the play is stopped by darkness or the weather when the scores of the two sides are even. A ball which hits the bat without being struck at, or hits the person of the batter or umpire, is a dead ball, and out of play. The foul-ball lines are unlimited in length, and extend in a straight line from the front angle of the home base, through the centers of the first and third bases respectively. A ball is fairly hit if it first touches the ground, a player's person, or other object, on or in front of the foul-ball lines.

The eight clubs which represent the league this year (1880) are Chicago, Cincinnati, Cleveland, Buffalo, Boston, Providence, Worcester, and Troy.

BASE-COURT (*basse-cour*), the outer court of a feudal mansion, which contained the stable-yard and accommodation for servants. It was distinct from the principal quadrangle, and was sometimes constructed of timber.

BASEDOW, JOH. BERNH. (properly, Joh. Berend Bassedau, or Bernh. von Nordalbingen, as he is often called), a remarkable educationist of the 18th c., was b. 8th Sept., 1723, at Hamburg, where his father was a peruke-maker. He attended the Johanneum there from 1741 to 1744, and afterwards studied theology and philosophy at Leipsic, from which he went in 1746 as a private tutor to Holstein. In the year 1753, he was appointed a master in the academy for young noblemen at Soröe. In 1761, he was removed from the gymnasium at Altona on account of heterodox opinions. Rousseau's *Emile* awakened in him, in 1762, the thought of improving the method of education, and of reducing to practice Rousseau's maxims and those of Comenius. Contributions from princes and private persons, amounting to 15,000 thalers (about £2171 sterling), covered the cost of his *Elementarwerk*, which, after the most pompous announcements, appeared as an *orbis pictus*, with 100 copper-plates by Chodowiecki, and was translated into French and Latin. Therein the young receive a large number of representations of the actual world, whereby B. sought at once to delight the eyes and to awaken a sentiment of cosmopolitanism, at which his whole method aimed. As a model school on this method, he established in 1774 the *Philanthropin* at Dessau, to which place he had been called in 1771. His restlessness of disposition, and the quarrels in which he was involved, especially with his active but capricious coadjutor Wolke, caused him to leave the Philanthropin; but he proceeded with as much eagerness as ever in endeavors to give effect to his ideas by educational works, which, however, aimed more at popularity than solidity, until, after many changes of residence, he died at Magdeburg, 25th July, 1790. His influence on the public mind of his age, particularly in Germany, was very great. He has been justly reproached with disparaging the ancients, a consequence chiefly of his own want of sound scholarship, and with a multitude of exaggerations, mistakes, and conceits; yet it cannot be disputed that his numerous philosophical and educational works powerfully awakened attention and interest in the much-neglected subject of education, and that he set many excellent ideas and weighty truths in rapid circulation among men.

BASEDOW'S DISEASE, GRAVES' DISEASE, or EXOPHTHALMIC GOITRE, a disease characterized by palpitation of the heart, enlargement of the thyroid glands, anæmia, and prominence of the eyeballs; caused, according to some authorities, by paralysis of the vasomotor nerves. It is seldom incurable or dangerous.

BA'SEL, or BA'SLE (Fr. *Bâle*), a city and canton of Switzerland. The canton was divided in 1833 into two sovereign half-cantons, called *Basel-city* (Basel-stadt; in French, Basle-ville) and *Basel-country* (Basel-landschaft; in French, Basle-campagne). The half-canton of Basel-city consists only of the city, with its precincts, and three villages on the right bank of the Rhine: the remainder of the canton forms the half-canton of Basel-country. The canton of B. is bounded by France and Baden, and by the cantons of Aargau, Soleure, and Berne, and has, according to different estimates, an extent of from 170 to about 200 sq. miles. Lying on the northern slope of the Jura, it is a country of hills and valleys. The mountains attain an elevation of from 2000 to 3000 feet. The chief rivers of B. are the Rhine (which flows through the n. part of the canton) and its tributaries, the Birz, and Ergloz. The soil is fertile and well cultivated. The climate, except in elevated situations, is very mild. The inhabitants are chiefly employed in agriculture, the cultivation of fruit-trees and of the vine, cattle-husbandry, fishing, salt-works, the manufacture of ribbons (which are manufactured to the value of £400,000 sterling annually), paper, woolens, linens, and leather. The transit trade is very considerable.

The city of B. arose out of the Roman fortified post of Basilia or Basiliana, near Augusta Rauracorum, of which once more important place the little village of Augst, near B., exhibits a few ruins. On the division of the Frank empire, the district of B. fell to Louis or Ludwig the German. The emperor Henry I., in the earlier part of the 10th c., rebuilt the town, which had been destroyed. It then became a place of importance, and belonged for a time to Burgundy, but after 1032 formed part of the German empire. It became at an early period the seat of a bishop, who, from the 11th c., shared in the supreme power with the imperial governor, a number of noble families, and the burgesses. Amidst many internal and external disturbances, the power of the nobility was gradually broken, that of the bishop restricted, and the authority of the burgesses extended. Surrounding towns were also destroyed, or conquered, and purchased, along with their territories, so that the city extended its dominion over a country district which until very recently was kept in a state of dependence and subjection. Involved in many feuds with the house of Hapsburg, B. closely allied itself to the Swiss confederacy; and after the peace between the emperor Maximilian I. and the confederacy, B. formally joined it in 1501. From 1519 onwards, the writings of Luther were printed in B.; and at the end of twenty years from that time, the reformed doctrine had become generally prevalent, the chapter of the cathedral had left the city, and the convents had been suppressed. After the union with Switzerland, the triumph of the burgess party became also more complete, part of the nobility emigrated, and those who remained were placed upon the same level with the freemen of the municipal corporation. Orderly industry, economy, and an external severity of manners, became the characteristics of the citizens; but the peace of the city was not unfrequently disturbed by strifes consequent upon the assertion of what was deemed undue authority by the magistrates. The government of the city, to which the whole canton was subject, was intrusted to a great and a little council, under the presidency of alternate burgomasters and chief wardens of the guilds; but the little council, uniting legislative and judicial functions with the highest executive authority, became gradually more and more preponderant. All parties in the city, however, remained always well combined against the country district; and persons belonging to the city were appointed to all offices, civil and ecclesiastical, whilst the depression of the country district was completed by the neglect of a proper provision for education. This state of things caused great dissatisfaction, which repeatedly broke out in fruitless rebellion. Under the impulse communicated by the French revolution, equality of rights was conceded in 1798; but in 1814, although the equality of rights remained apparently intact, the new constitution of the canton was so framed, and the representation so distributed, as virtually to make the city again supreme. The discontent of the country district became so great that, after unsuccessful attempts to obtain redress of grievances by petition, civil war broke out in 1831, which did not cease till the troops of the Swiss confederation took possession of the canton, and the diet recognized the separation of the city and the country district, as sovereign half-cantons, in 1833. The constitutions of the two half-cantons are in most respects similar, and are framed on the basis of the old constitution, modified in accordance with the principle of universal suffrage. According to the census of 1870, the half-canton of Basel-city contained 47,760 inhabitants, of whom 34,457 were Protestants; and Basel-country, 54,127, of whom 10,245 were Roman Catholics. By the federal constitution, proclaimed May 29, 1874, the half-canton of Basel-city sends two, and the half-canton of Basel-country three, members to the national council. The capital of Basel-country is Liestal. Since its separation from the city, more ample provision has been made for education, and there has been a rapid increase of material prosperity. Both Roman Catholic and Protestant clergy are paid by the state, and the parishes of the reformed church have received the right of choosing their own pastors.

The city of B. was much more populous in the middle ages than it is now. Its population in 1870 was 44,834. In the 14th c., the number of its inhabitants was greatly reduced by the plague, or "black death" (q.v.), which raged in it with terrible severity, and sometimes mentioned as the "death of Basel." It is well-built and clean, but its appearance does not proclaim it the wealthiest city in Switzerland, which, however, it is. Amongst its buildings are a cathedral, founded in the beginning of the 11th c., by the emperor Henry II., and bridge over the Rhine, built in 1226. The Rhine divides the city into two parts—great B., on the s. side, and little B., on the north. B. is connected by railway with Strasburg on the one hand, and Berne, Lucerne, Zurich, etc., on the other. It has many benevolent and educational institutions, among which are an orphan asylum, and an institution for deaf mutes; a university, founded in 1459, which has a library of 120,000 volumes, and a very valuable collection of manuscripts, a numismatological collection, a botanic garden, and a museum of natural history; the new museum, in which there are several pictures of the younger Holbein, who was long resident in B. (some accounts say he was born here); a public library of 70,000 volumes. During the reformation, the university was a central point of spiritual life, and it has numbered among its professors men of great eminence in learning and science, including Erasmus, who died here in 1536, and the mathematicians Euler and Bernouilli, who were natives of B.; but it is now little frequented. The pop. of the whole canton in 1876 was 107,063.

BA'SEL, COUNCIL OF, a memorable and important ecclesiastical council, held in the city of Basel. It was summoned by pope Martin V., and his successor, Eugenius IV., in accordance with an announcement made at the council of Constance, and was opened on 14th Dec., 1431, under the presidency of the cardinal legate Julian Cesarini of St. Angelo. The hall in which it met is still shown at Basel. It addressed itself to the reconciliation of the Hussites with the Roman Catholic church, and to the reform of abuses in the church itself. But the first attempt to conciliate the Hussites, whom an army of crusaders had in vain sought to subjugate, was met with resistance by the pope, who not only refused his sanction, but empowered the cardinal legate to dissolve the council. The council strongly repelled the pope's pretension of right to dissolve it, and proceeded with its business. His injunctions, that it should remove to Italy, were equally disregarded. It renewed the decree of the council of Constance, asserting the right of a general council to exercise authority over the pope himself, and on his persevering to issue bulls for its dissolution, caused a formal process to be commenced against him, and cited him to appear at its bar. It assumed the papal powers, and exercised them in France and Germany, where its authority was acknowledged. It concluded a peace, in name of the church, with the Calixtines, the most powerful section of the Hussites, by the Prague compact of 20th Nov., 1433, granting them the use of the cup in the Lord's supper. By this, the emperor Sigismund was much helped in obtaining possession of Bohemia; and he in return sought to reconcile the council with Eugenius IV., who, being hard pressed by insurrections in the states of the church, and afraid of losing his whole influence in France and Germany, solemnly ratified all its decrees, by a bull dated 15th Dec., 1433. Desirous, however, of limiting the papal prerogatives, the council restored to the chapters of cathedral and collegiate churches the free right of election to stalls and benefices, of which the pope had assumed the right of disposing; and with a view to the reformation of gross abuses, restricted the power of granting interdicts, and prohibited *annats* and other grievous exactions. It left the pope the right to dispose of those benefices only which belonged to the diocese of Rome, and prohibited the bestowal of reversions to ecclesiastical offices. It also appointed punishments for certain immoralities in the clergy; and prohibited festivals of fools, and all the indecencies which had been commonly practised in churches at Christmas. It adopted decrees concerning the election of popes, and for the regulation of the college of cardinals.

Eugenius, exasperated to the utmost, complained loudly to all sovereign princes. At this time, a prospect was opened up of the union of the distressed Greeks with the church of Rome; and both the pope and the council endeavored to make use of this for the advancement of their own interests and influence. Both despatched galleys for the Greek deputies, but through the intrigues of his agents, the pope was successful, and brought the Greek deputies to Ferrara. The archbishop of Tarentum, a papal legate at B., circulated an ordinance in name of the council, and sealed with its seal, recommending Udine or Florence as the place of conference. The ordinance was a forgery, and this proceeding put an end to forbearance on the part of the council, which, on July 31, 1437, again cited the pope to its bar; and not only on his failing to appear, declared him contumacious, but on his opening an opposition council at Ferrara, went so far as, on Jan. 24, 1438, to decree his suspension from the functions of the popedom. His party, however, was so strong that this decree could not be carried into effect; and some of those who had been among the most influential members of the council, the cardinal legate Julian himself, and the greater number of the Italians, left B., and went over to his side. All the more resolutely did cardinal Louis Allemand, archbishop of Arles, a man of most superior understanding, courage, and eloquence, now guide the proceedings of the council, which, on May 16, 1439, declared the pope a heretic, for his obstinate disobedience to its decrees; and in the following session, formally deposed him for simony, perjury, and other offenses. On this occasion, the holy relics which were in B. were deposited in the places from which the Spanish and Italian members of

the council had disappeared; and the sight of them produced much emotion, and reanimated the courage of the assembly, still consisting of 400 prelates, priests, and doctors, mostly French and German. On Nov. 17, 1439, the council, notwithstanding the still further diminution of its numbers, caused by the plague in B., elected duke Amadeus of Savoy to be pope, who then lived as a hermit in Ripaglia, on the lake of Geneva. He accordingly styled himself Felix V., but was recognized only by a few princes, cities, and universities. The emperor Sigismund was dead, and even France and Germany, although they accepted the reforming decrees of the council, thought proper to remain neutral in the question regarding the popedom. The friendship of the emperor Frederick III. strengthened the party of Eugenius; and the council gradually melted away, till careful only for personal security, its members, after three years of inactivity, held its last session at B. on May 16, 1443, and removed its seat to Lausanne. Here a few prelates still remained together under the presidency of cardinal Allemand, till in 1449, after the death of Eugenius, and the resignation of the anti-pope Felix, an amnesty was offered to them by the new pope, Nicholas V., which they joyfully accepted. The B. reforming decrees are contained in no Roman Catholic collection of decrees of councils, and are held to be invalid by the canonists of Rome; yet they are of authority in canon law in France and Germany, where they were included in pragmatic sanctions, although their application has been modified by more recent concordats.

BA'SEL, TREATY OF. Basel gives its name to two important treaties of peace, concluded there on 5th April and 22d July, 1795, between the representatives of the French republic, Prussia, and Spain, by which Prussia withdrew from the coalition against France, took under her protection all the states of northern Germany which should, like herself, relinquish the war in which the German empire was engaged, and also gave up to the victorious republic her possessions beyond the Rhine; whilst Spain gave up her portion of St. Domingo, and prepared the way for that alliance with France which was afterwards productive of consequences so important.

BASEL'LA, a genus of plants, generally regardsd as belonging to the natural order *chenopodiaceæ* (q. v.), but by some botanists as a type of a distinct order, *basellaceæ*. The species are all tropical. *B. alba* and *B. rubra* are known in Britain as stove biennials. They are plants with twining stems, in commn use as pot-herbs in the East Indies, and cultivated in China. In the neighborhood of Paris, they are raised on hotbeds, transplanted into warm borders, and furnish a substitute for spinach in summer. *B. rubra* yields a very rich purple dye. The great flesh root of *B. tuberosa*, a South American species, also with a twining stem, is edible.

BASE OF OPERATIONS, in military maneuvers, is some spot or line which the general of an army relies upon as a stronghold and magazine. An army cannot take with it all the food, forage, and ammunition for a long war; the consumption is enormous, and a constant supply is indispensable. Again, the sick and wounded cannot accompany the army through toilsome marches; the commander endeavors to send them back to some place of safety. Furthermore, fresh troops must have some spot from which they can safely advance through the enemy's country. To secure all these advantages, a *B. of O.* is necessary. It may be a port, a stretch of sea-coast, a river, a mountain-range, according to circumstances; but it must be such as to serve as a magazine of supply, a place of retreat under disaster, and the end of a line of open communication extending to the spot occupied by the army. When lord Raglan and marshal St. Arnaud advanced from the Alma towards Sebastopol, in Sept. 1854, they intended to attack the great fortress on the north side; but the tactics of the Russians prevented this; and the allies, changing their plan, resolved on the celebrated flank-march to Balaklava, by which they secured the whole coast from Balaklava to Kamiesch as a *B. of O.* during the siege of Sebastopol. See BALAKLAVA. In the military contests arising out of the Indian mutiny, in 1857 and 1858, Cawnpore was the chief B. of O. whence Havelock, Outram, and Clyde made those advances toward Lucknow which led ultimately to the suppression of the revolt. In the Italian war of 1859, the Austrian B. of O. was very fluctuating, owing in part to the disaffected state of the Lombard population around the great fortresses of Mantua, Peschiera, etc.; and indeed the only reliable base was furnished by the eastern and Tyrolese Alps. The French and Sardinian base, in the same war, was virtually Genoa, and the line of country extending thence to the great stronghold of Alessandria.

BA'SHAN, or BATANÆA, a country of Palestine, stretching from mount Hermon in the anti-Libanus on the n., to the brook of Jabbok on the s., and bounded on the w. by the Jordan, its eastern limits not being very clearly defined. Ashtaroth and Edrei were its chief cities, and the residence of its kings during the Amoritish dynasty. The last of its Amorite rulers was Og, who with all his sons was killed by the Israelites under Moses, at the battle of Edrei; and the half tribe of Manasseh settled in the land. The men of B. were remarkable for their stature, its pastures for their richness, and its sheep and oxen for their size and fatness. B. belonged to the tetrarchy of Philip, and afterwards to that of Agrippa II.

BASHAW' (Turkish, *basch;* Arabic, *basha;* Persian, *pasha*, the way in which the word is now commonly written) signifies head, or master, a Turkish title of honor given

to viceroys, provincial governors, generals, and other distinguished public men. The term B. is also used to characterize a man of an arrogant and domineering disposition.

BASHEE' or BASHI **ISLANDS**, a small cluster in the line between Luzon, the chief of the Philippine chain, and Formosa, the lat. and long. being respectively 21° n. and 122° east. Politically, they are a dependency of the Philippines, having been colonized by the Spaniards in 1783. Physically, they form a link in the vast archipelago which, from Formosa to Sumatra inclusive, connects the s.e. of China with the w. of Malacca. They were discovered in 1687 by Dampier, who called them the Bashi Islands, on account of the popularity among the islanders of an intoxicating liquor of that name. Pop. about 8000.

BASHI-BAZOUKS' are irregular troopers in the pay of the Sultan. Very few of them are Europeans; they are mostly Asiatics, from some or other of the pashalics in Asiatic Turkey. They are wild turbulent men, ready to enter the Sultan's service under some leader whom they can understand, and still more ready to plunder whenever an opportunity offers. During the Russo-Turkish war of 1854, etc., they had many encounters with the enemy in that kind of irregular warfare which the Russians intrust to Cossack horsemen; but the peaceful villagers had almost as much distrust of the B. B. as of the Russians. When the British government resolved, in 1855, to take into pay a Turkish contingent, to aid in the operations of the war, a corps of B.B. was put in charge of an Indian officer, but the task of reducing them to discipline was not completed when the war ended. Their ferocity was exhibited in the Servian war, but most relentlessly in the massacre of Batak, where, in May 1876, under Achmet Agha, they slew over 1000 defenseless Bulgarians in a church in which they sought refuge.

BASH'KIRS, or BASHKURTS; a people in Orenburg and Perm, Russia, on the slope and plains of the Ural. They are a mixture of Finns, Tartars, and Ostyaks. Until the arrival of the Hungarians, about the middle of the 13th c., the B. were strong and independent, and troublesome to their neighbors. In 1556, they voluntarily accepted the supremacy of Russia, and the city of Upha was founded to defend them from the Kirghiz. Three times they rebelled, in 1676, 1707, and 1735, but were reduced to subjection. They are now divided into 13 cantons, under the jurisdiction of the gov.gen. of Orenburg. They maintain a military cordon, escort caravans through the Kirghiz steppes, and are employed in various other services. They are divided into settled and nomadic, the former chiefly agriculturists, and the latter cattle raisers. They are hospitable, but suspicious, poor, apt to steal, and exceedingly lazy. They have large heads, small foreheads, eyes narrow and flat, ears standing straight out, and black hair; but are muscular and strong, and capable of enduring much labor and privation. They are of limited intellect, and their Mohammedanism is rather a profession than a practice.

BASIDOH', or BASSADORE', the principal station for British ships in the Persian gulf, situated at the w. end of the island of Kishm.

BASIEN'TO, or BASEN'TO, a river of Italy, which, rising in the Apennines, w. of Potenza, flows in an e.s.e. direction through the province of Basilicata to the gulf of Taranto, which it enters 25 m. w.s.w. of Taranto city. Near its mouth are the remains of the once famous city of *Metapontum*, where Pythagoras died.

BA'SIL, *Ocymum*, a genus of plants of the natural order *Labiatæ* (q.v.). The species are all natives of the tropics, or of the warmer temperate parts of the world, and are generally characterized by a pleasant aromatic smell and taste. They are reckoned among *sweet herbs*.—SWEET B. (*O. Basilicum*) is an annual plant, a native of the East Indies, about one foot high, with ovate or oblong leaves, and flowers in whorls of six, which has long been cultivated in Europe for culinary purposes, being used as a seasoning. It has also enjoyed the reputation of being a palliative of the pains of childbirth.—BUSH B. (*O. minimum*), also a native of the East Indies, is cultivated for the same purposes, and possesses the same qualities. It is a plant about 6 in. high, with an orbicular bushy head. In Britain, the seed of both species, obtained from the s. of Europe, is generally sown on a hot-bed, from which the plants are afterwards removed to the open ground.—A native British plant of the same order (*Clinopodium vulgare*) bears the name of WILD B., and another (*Acinos vulgaris*, formerly *Thymus Acinos*) is known as B. THYME. Both are fragrant and aromatic.—B. vinegar is made in the same manner as mint vinegar, by steeping the leaves in vinegar. It is used for seasoning, in winter, when the fresh plant cannot be obtained.

BA'SIL, surnamed THE GREAT, and called St. B., one of the most eminent and eloquent of the Greek fathers, was b. about 329 at Cæsarea, in Cappadocia; studied under the heathen philosophers at Athens, and became an advocate in his native city, but afterwards founded a monastic society; was ordained a presbyter in 362; and succeeded Eusebius as bishop of Cæsarea in 370, in which office he continued till his death in 379. He resolutely resisted invitations to the court of Julian the Apostate, with whom he had contracted an intimacy as a fellow-student at Athens, and displayed great constancy when the emperor Valens began to persecute him, on account of his opposition to Arianism. He was engaged in most of the controversies of his time, but conducted controversy in a peaceful and generous manner. His rules of monastic life are still followed in the Greek and other oriental churches, in which he is highly honored as one of

the greatest of saints. In the Roman Catholic church, also, they are followed in a few convents, styled of the order of *Basilians*. The influence of B. was greatly felt in the promotion of monasticism throughout the west as well as the east, and to him is ascribed the introduction of the three universal monastic vows of obedience, chastity, and poverty. The best editions of his works are that of the Benedictines (3 vols. Par. 1721–30, fol.), and that of the brothers Gaume (3 vols., Par. 1835–40, 8vo); but the authenticity of many of the moral and ascetic pieces is doubtful. His anniversary is celebrated, in the Greek church, on the 1st of Jan.—the day of his death; in the Latin church, on the 14th of June—the day of his ordination.

BA'SIL I., the Macedonian, emperor of the east, was b. in a village of Macedonia, in 813 A.D., or, according to others, in 826. His early life is differently related, but his biographers agree that he came to Constantinople when still a young man, and was appointed chamberlain to the emperor Michael in 861. Subsequently, the emperor made him his colleague in the sovereignty. B. now used his influence to restrain Michael from committing those excesses which rendered him hateful to the people; but when he found his remonstrances unavailing, he headed a conspiracy against him, the result of which was the assassination of the emperor in 867. His first care was to heal the wounds both of the church and the state. He replaced Ignatius upon the patriarchal throne, and dismissed Photius, whom, however, he re-established in his authority the year after. His valor made him the terror of the Saracens, from whom he reconquered Asia Minor. The prodigality of Michael had exhausted the public treasury; by a wise economy, B. refilled it. All extortioners, moreover, were sought out and punished. The profligate companions of the late manarch were condemned to disgorge one-half of the largesses which Michael had showered upon them. B. also entered into a treaty of alliance with the Russians of Kiew, to whom he sent missionaries to preach the gospel, and who, from that time, began to embrace Christianity, and acknowledge the authority of the Greek church. He died in 886, from wounds which he received while hunting a stag. Several letters of his are still extant, besides a book full of wise advice addressed to his son.

BASIL II., 958–1025; emperor of the east. He and his brother Constantine were kept from the throne by their stepfather, Phocas, until 976. Constantine left the government to B., who had a stormy reign and almost constant war. He suppressed a formidable revolt, defeated the attempt of the emperor of Germany to seize certain Italian districts, and had several conflicts with the caliphs of Bagdad and the Sicilian Arabs. In 987 war began with Bulgaria, and continued with brief interruptions nearly 20 years, when Bulgaria became thoroughly subdued. After one of the hard earned victories in this war, B. ordered the eyes of 99 in every 100 of 15,000 prisoners to be put out, the one spared having to guide his blind companions back to Bulgaria. When the cries of those tortured men were heard by the Bulgarian king, he was so shocked that he died three days afterwards.

BASILE'AN MANUSCRIPTS, two valuable MSS. of the Greek Testament now in the public library of Basle. I. A copy of the four gospels entire except that Luke iii. 14–15, and xxiv. 47–53 are wanting, and that Luke i. 69, ii. 4, xii. 58, xiii. 12, and xv. 5–20 are by a different hand. It is written in uncial letters, round and full, with accents and breathings. Each page contains only one column with the Ammonian sections; and, instead of the Eusebian canons, there are references at the foot of each page to the parallel sections of the other gospels. There are indications of its having been used as a church MS. at Constantinople and it is a good specimen of the class of texts derived from that city. It seems to belong to the 8th c., and the additions to the 9th century. It was presented to a monastery at Basle, in the 15th c., by cardinal Ragusio. It has been collated by several of the best critics, but has never been published. II. A MS. of the entire Greek Testament except the Apocalypse, also presented to the monks of Basle by cardinal Ragusio. It is written in the cursive characters and different parts of it are of very unequal value. The text of the acts and epistles is of slight importance, but that of the gospels is very remarkable and adheres closely to the oldest uncials. There are 38 lines on a page; the writing is excellent, with accents, breathings, *iota subscripts*, and some illuminations. It is assigned to the 10th c., and seems to be the source from which codex 118 of the Bodleian library was copied.

BASILIAN MANUSCRIPT, an uncial copy of the Apocalypse found among ancient homilies of Basil and Gregory of Nyssa. It is named from the Basilian monastery at Rome, to which it formerly belonged. It is now deposited in the Vatican library. Tischendorf, in 1843, was allowed to make extracts from it, and having compared its whole text with a Greek Testament, published the result, which Tregelles afterwards had the opportunity to compare again with the manuscript, and to correct. The letters are simple and unornamented, holding a middle place between square and oblong. The breathings and accents are by the first hand. It probably belongs to the early part of the 8th century.

BASILIAN MONKS, or MONKS of ST. BASIL; an order founded by St. Basil in the 4th c.; it grew to 90,000 in number before the death of the founder. The principal monastery now is at St. Saviour, in Messina. They are numerous in Spain, Italy, and

Sicily, and the greater portion of the monks of the Greek church in Russia are of the order. Their records show that the order has furnished 14 popes, many cardinals, and nearly 12,000 martyrs.

BASIL'ICA, a code of laws of the Grecian empire, the compilation of which was begun in the reign of the emperor Basil I., the Macedonian, who died in 886—from whom it is generally supposed to have derived its name; completed by his son Leo, the philosopher; and revised, in 945, by order of Constantine Porphyrogenitus, the son of Leo. There is some doubt whether the work has come down to us as completed by Leo, or as revised by Constantine, and unfortunately we do not possess the whole of the sixty books of which it originally consisted. It was very much an adaptation of the code of Justinian to altered circumstances, and is of great value for the interpretation of the *Corpus Juris*. The principal editions are that of Fabrott (7 vols. fol. Par. 1647), and the recent one of Heimbach (vols. 1–5, Leip. 1833–50), which includes portions discovered since Fabrott's time. The B. has been the subject of many commentaries.

BASIL'ICA (Gr. *basilike*, from *basileus*, a king). Originally, the B. seems to have been the hall or court-room in which the king administered the laws made by himself and the chiefs who formed his council. When monarchy was abolished at Athens, the second of the magistrates who succeeded to the kingly power was called the archon-basileus, the first being styled the archon by pre-eminence; and it is as the court or hall (stoa) in which the archon-basileus administered justice, that the B. first appears in authentic history. But it was amongst the Romans that the B. attained its chief importance; and in addition to its original use as a court of justice, became a market-place, an exchange, a place of meeting for men of business generally. It was not till a comparatively late period, however, that a B. was erected at Rome. The first we hear of is the B. Porcia in 182 B.C. From this period till the time of Constantine, they were constructed in great numbers. Some twenty are known to have existed in Rome, and latterly, every provincial town, even those of small extent, had each its B., as that of Pompeii, which is now the most perfect example, still testifies. The most frequented part of the city was always selected for the site of a B.; and as this was almost always the forum, the words forum and B. are occasionally used as synonymous by ancient writers. The earliest basilicas were entirely open to the external air. It was usual, for this reason, as well as for the convenience of those who might be compelled to frequent them in bad weather, to select for them a sheltered and convenient position. Latterly, an external wall was substituted for the peristyle of columns with which the original basilicas were surrounded; the external columns, if continued at all, being used only as a decoration, and confined generally to the vestibule. It was in this form that the B. suggested the idea of the Christian church, as has already been explained under apse (q.v.); and the readiest mode of explaining the structure of the B. to a modern, is to imagine the process which was then performed reversed, and in place of converting the B. into a church, to convert the church into a basilica. This will be effected by simply removing the roof from the *nave*, the aisles remaining covered, and even being frequently furnished with galleries, as in Protestant churches. The judge's seat was generally in a circular portion of the building which protruded from its further end, in which the altar was afterwards placed (see APSE), the great entrance to the B. fronting it, as the western door of a cathedral fronts the high-altar. The space required by the pretor for his court was separated by a railing from the other portions of the building, which were devoted to the various purposes we have mentioned. It must not be supposed from this description, that the form of the B. was always the same. Sometimes there was no hemicycle or apse, as in the B. at Pompeii, in which case the tribunal was cut off from the nave; sometimes there were two; as in the B. of Trajan. Again, the B. was sometimes entered, not from the end, but from the sides, where the transepts of a modern church are situated; and at the end opposite that in which the tribunal was placed, there was often a row of small chambers, the uses of which do not seem to be very accurately ascertained, and probably were not invariable. In the plan of the B. of Pompeii, there was an outside stair which led to the upper gallery, which in this case passed entirely round the building. The gallery was the place to which loiterers usually resorted for the purpose of watching the business proceedings below; and the one half of it is said to have been devoted to men, the other, to women. Of the vast size of some of these buildings, we may form a conception from the accommodation which must have been required for the tribunal alone, where, in addition to the curule chair of the pretor, and space required by the suitors and their advocates, seats had to be provided for the *judices* or jurymen, who occasionally amounted to as many as 180.

Many of the principal churches in Italy, and particularly in Rome, are still called basiliche.

The term B. was also applied in the middle ages to the large structures erected over the tombs of persons of distinction, probably from their resemblance to small churches; thus, the tomb of Edward the confessor, in Westminster, is called a B. (see chronicle of the mayors of London, quoted by Parker).

BASILICA'TA, or as it is also called, POTENZA, a province in the s. of the kingdom of Italy, includes nearly the same territory as ancient Lucania. Foggio and Avellino bound it on the n.; Bari and Lecce on the n.e. and e.; the gulf of Taranto and Cosenza,

s.e. and e.; and Salerno and the Mediterranean, on the west. Its area is 4000 sq. miles. Pop. '71, 508,880. The capital is Potenza; the other chief towns are Francavilla and Tursi. B. lies mainly on the e. side of the main ridge of the Apennines, between it and the gulf of Taranto. The interior is wild and mountainous, and though there are some large forests in the province, the general aspect is bare and barren. Four considerable rivers—the Basiento, Brandano, Agri, and Sinno—flow through it from the w. in an e.s.e. direction, forming as many valleys, which slope gradually into an exceedingly fertile plain, varying in breadth from 4 to 10 miles. Here corn is raised in abundance, also wine, hemp, tobacco, and liquorice. Swine, sheep, and goats are reared in the mountainous districts, and silk forms a product of the valleys. B. is greatly in need of good roads, and is much subject to earthquakes.

BASIL'ICON (Gr. "royal," or of great virtue), a name given to an ointment composed of yellow wax, black pitch, resin, and olive oil. Hence it was called *unguentum tetrapharmacum* (*tetra pharmaka*, four drugs). The resin, wax, and pitch are melted together over a slow fire; the oil is then added, and the mixture, while hot, strained through linen. The straining is directed in consequence of the impurities which resin often contains. B. ointment, or resin cerate, as it is sometimes called, is much used as a gently stimulant application to blistered surfaces, indolent ulcers, burns, scalds, and chilblains.

BASIL'ICON DO'RON (Gr. royal gift), a celebrated prose work of king James VI. of Scotland, written for the instruction of his son, prince Henry, a short time previous to his accession to the English throne. It consists of three books. The first treats "Of a King's Christian Duty towards God;" the second, "Of a King's Duty in his Office;" and the third, "Of a King's Behavior in Indifferent Things." It was first published in 1599; afterwards in London in 1603, 8vo; and translated into Latin by Henry Peacham, who presented it, richly illuminated, to the prince. This Latin version was published in London in 1604, 8vo. A French edition appeared at Paris in 1603, 8vo, and another in 1604, 16mo. Like the royal author's famous work on *Demonology*, and his *Counterblast to Tobacco*, the *B. D.* is now only considered as a literary curiosity.

BASILI'DES, an Alexandrian Gnostic, who flourished during the reigns of Trajan, Hadrian, and Antoninus Pius. Regarding his life, little is known. He is said to have taught in Antioch; afterwards in Persia; and, finally, in Egypt, where he is supposed to have died shortly before the middle of the 2d century. He was a disciple of one Glaucias, not elsewhere mentioned in history, but whom he terms an interpreter of St. Peter, and from whom he alleges that he had received the esoteric faith of that apostle. B. probably considered himself a Christian, but his fantastic speculations bore a greater resemblance to the doctrines of Zoroaster, and in some points to the Indian philosophy, than to the religion of Christ. According to the system of B., there are two eternal and independent principles—the one, good; the other, evil. Whatever exists, emanates from these. The good principle—i.e., the supreme God, or Father—constitutes, with his seven perfections, viz., the mind, the word, the understanding, power, excellences, princes, and angels, the blessed ogdoad (combination of *eight*). These seven perfections, or powers, in which the supreme God is reflected, are in their turn themselves reflected, but more feebly, in seven other angelic powers, which emanate from them; and so on through the whole circle of emanations, which amount to 365, the mystic number so often inscribed on the symbolic stones in the Gnostic schools (see ABRAXAS STONES). Each of these angelic powers governs a world. There are, consequently, 365 worlds, to each of which B. gave a name. The head of the 365th, or lowest world, rules the material universe, which, along with other angels, he also created. He is the God or Jehovah of the Old Testament, and when the earth was divided among the rulers of the material universe, the Jewish nation fell to the share of himself, who was the prince of the lowest class of angels. But wishing to absorb all power himself, he strove against the other angels, and to make them subject to his "chosen people," the result of which was war, strife, division in the world, together with the loss of the true religion, to restore which the supreme God sent the first Æon (*Nous*, or intelligence), who united himself to the man Jesus at his baptism, and so taught men that the destiny of their rational spirit was to return into God. This *Nous*, however (who was the true Christ), did not really suffer crucifixion, for, changing forms with Simon of Cyrene, he stood by *laughing* while Simon suffered, and afterwards returned to heaven. B. also taught the doctrine of a purgatorial transmigration of souls in the case of the wicked. His disciples (Basilidians) were numerous in Egypt, Syria, Italy, and even in Gaul, where they continued to exist till the 4th century. They were accused by their enemies of Antinomianism and "magic," but whether on good grounds or not, cannot be ascertained.

BASILIS'CUS, d. 477, Emperor of the East. In 468 A.D. he commanded the armament that Leo I. sent against Genseric, who defeated him. B. seized the throne of the east in 474, but was deposed two years later by Zeno.

BASILISK, according to ancient and mediæval authors, a terrible creature, which, however, may be regarded as entirely fabulous—the fables concerning it being so many and so monstrous, that it is vain to seek for any foundation of truth, or to inquire if any of them originally had reference to any particular creature whatever. The ancients, as Dioscorides, Galen, and Pliny, describe it as a serpent: in the middle ages, it was gener-

ally represented as more of a lizard appearance, but provided with eight instead of four feet. It appears to have been at last pretty completely identified with the cockatrice (q.v.), which was believed to be generated in a very wonderful manner, being produced from an egg laid by an extremely old cock, and hatched by a toad; for which reason we find the B. sometimes figured with something like a cock's head. The B. was the king of dragons and serpents, all of which left their prey to it whenever it approached; whence its name, *basiliscus* (Gr.), diminutive of *basileus*, a king—sometimes exactly translated into Latin by *regulus*. It had some prominences on its head, which, when it was figured in books, assumed very exactly the appearance of a crown. It inhabited the deserts of Africa, and, indeed, could only inhabit a desert, for its breath burned up all vegetation; the flesh fell from the bones of any animal with which it came in contact, and its very look was fatal to life; but brave men could venture into cautious contest with it by the use of a mirror, which reflected back its deadly glance upon itself.—These things are still necessary to be mentioned, were it only on account of the allusions to them by poets and other writers.—The blood of the B. was, of course, extremely valuable to magicians. It occupies an important place in some of the legends of the saints, and pope Leo IV. is said to have delivered Rome from a B. whose breath caused a deadly pestilence.

The word B., and its equivalent *regulus*, are sometimes used in the Latin Vulgate, where the authorized English version of the Old Testament sometimes has *adder*, and sometimes *cockatrice;* but no trace of any of the marvels concerning the B. is to be found there.

BASILISK, *Basiliscus*, in modern zoology, a genus of saurian reptiles of the family of *iguanidæ* (see IGUANA), differing from the iguanas in the want of the dewlap or appendage of skin under throat, and of the series of the pores on the inside of each thigh; also in having a continuous elevated crest along the back and tail, capable of being erected or depressed at pleasure, and apparently intended to aid the motions of the animal in water like the corresponding fin of a fish.—The basilisks are remarkably adapted both for climbing trees and for swimming. Their feet are not webbed, their toes rather long. They are perfectly harmless creatures, very active and lively, and it is difficult to say why they should have received the name of the fabulous monster of antiquity, unless because their appearance is far from agreeable to those unaccustomed to it, and perhaps because an appendage at the back of the head may have been thought to represent the crown of the dragon king. This appendage is most conspicuously developed in the mitred or hooded B. (*B. mitratus*), a native of the tropical parts of America, and consists of a hood or membranous bag, capable of being dilated with air, and then about the size of a pullet's egg, which is supposed, notwithstanding its extremely different situation, to have a use somewhat analogous to that of the air-bladder of fishes. The mitred B. is from 25 to 30 in. long, including the long and very tapering tail. Another and larger species, of a generally greenish color (*B. Amboinensis*), inhabits the islands of the Indian archipelago, and is much used there for food. Its flesh is said to be very white and tender. It is often seen on the branches of trees above water, into which it drops when alarmed.

BASILOSAURUS. See ZEUGLODON.

BASIN, a geographical term of considerable importance. The *B.* of a river is the whole tract of country drained by that river, and is, of course, more or less concave. The line of boundary which separates one river-basin from another is called the water-shed. By tracing these water-sheds, the whole of a country or continent may be divided into a number of distinct basins; and this is one of the most instructive elements in the physical geography of a country. The *B.* of a lake or sea, again, is made up of the basins of all the rivers that flow into it.

BASIN, in geology, is a term applied to depressions in the strata, in which beds of a later age have been deposited. Thus, the London B., consisting of tertiary sands and clays, occupies a hollow in the chalk, which is bounded by the North Downs on the s., and by the chalk-hills of Berks, Wilts, Bucks, and Herts on the north. The term has also been applied to synclinal depressions of strata, which have been produced by the elevation or depression of all the strata contained in the B., as the coal-basin of s. Wales.

BASINGSTOKE, a t. in the n. of Hampshire, 46 m. w.s.w. of London. It is a place of much activity, being situated at the junction of five main roads to London from the s. and w. of England. The country around is fertile and wooded. The chief trade is in corn, malt, coal, and timber. Near the town is a tract of 108 acres, on which every householder has the right of pasturage. There is also, not far from the town, an ancient camp, surrounded by an irregular oval embankment, 1100 yards in circumference, with an entrance on the e. and w. sides. Basing House castle, belonging to the marquis of Winchester, long withstood the forces of the commonwealth, but Cromwell at last took it by storm, and burned it to the ground in 1645. Pop. '71, 5574.

BASKERVILLE, JOHN, a celebrated English printer and letter-founder, was b. in 1706 at Wolverley, in Worcestershire. He became a writing-master in Birmingham, and afterwards carried on the business of japanning there with great success. He began about 1750 to make laborious and costly experiments in letter-founding, and succeeded

in making types which have scarcely yet been excelled. He printed an edition of Virgil, at Birmingham, in 1756, which was followed by other Latin classics, a few English and Italian authors, and a New Testament (Oxf. 1763), much admired as specimens of printing, although not otherwise possessing high merit. His services to the art of printing met with little encouragement and no requital. He d. in 1775. He was a man of obliging disposition, but of a gloomy temperament, and condemned all religious service as superstition. Baskerville was buried in a tomb of masonry in the shape of a cone, under a windmill, in his garden; but the ground becoming valuable for building purposes, his remains were exhumed in the summer of 1821, and deposited in the vaults of Christ church, in the neighborhood of the spot where they were originally interred. Baskerville editions of works are now prized by persons of taste.

BASKET (Welsh, *basged*, or *basgawd*, a netting or weaving of splinters), a domestic utensil, usually made of willows, reeds, or chips, interwoven, although sometimes the materials are gold, silver, iron, glass, etc. Baskets have been in use from very early ages. The Israelites were commanded (Deuteronomy xxvi. 2) to offer unto the Lord, as soon as they came into possession of the land of Canaan, "the first of all the fruit of the earth" in a *basket*. The baskets used on such occasions by the rich Jews were made of gold and silver, and were returned to the offerers; but those used by the majority of the people were of barked willow, and were retained by the priests. The ancient Britons were remarkably expert in the manufacture of baskets, which were much prized by the Romans for their neatness and elegance. The process of basket-making is very simple, and appears to be well known among the rudest peoples—even among the aborigines of Van Diemen's land. In this country the willow is chiefly used in the manufacture of baskets. In several parts of England and Scotland, great attention is paid to the cultivation of the willow; and judging from the statements of some of the cultivators, the returns yielded are very satisfactory. One calculates his profits at £18, 10s. per acre, and another at £10 per acre. The tools required being few and inexpensive, a large number of poor persons are engaged in the manufacture of baskets, that are hawked about the streets by their wives and children. Basket-making also forms a part of the industry of almost all blind asylums. Baskets are of all shapes and sizes, and their uses are so well known to all as to obviate the necessity of description here. Baskets to the value of £30,000 or £40,000 are annually imported from the continent.

BASKET FISH, a species of the genus *astrophyton*, or star-fish, having a most remarkable development of arms. Its body is a five-sided disk, surmounted by the numerous arms. The disk (in one specimen measured) has a diameter of 2¾ in.; and one of the arms is, in its entire length, 9 in., but as it lies coiled up, like a basket, it is about 8 in. across the whole. The size varies with age, but the above is about the average, many being less than half as large, and others twice as great. The upper side of the disk has 10 radial ribs bearing short, blunt spines. The mouth is on the under side, and central. It is set with spiniform bristles hiding 24 thorn-like teeth. From around the star-shaped mouth branch 5 stout arms, each of which is divided at the edge of the disk. The animal is wholly covered with an epidermis, granulated above, but smooth beneath, except that it seems to have a double line of stitches under each arm. The general color is light buff; but the inter-brachial spaces in the living animal vary from dark purple to bright pink. The constant division of each arm at regular intervals into 2 smaller ones is a most remarkable peculiarity. Each of the 5 main branches is divided into 2, making 10 in all; each of the 10 is divided, making 20—and so indefinitely down to the least visible filament. Winthrop counted 81,920 of these "small sprouts, twigs, or threads." On capture or disturbance the creature instantly folds its arms closely about its body, shrinking from the touch like a sensitive plant, and assuming the basket shape from which it gets its familiar name. The attempt to untwist these coils generally ends in breaking the delicate, but tenacious threads. The basket fish is a voracious feeder, and its peculiar construction aids it in taking its prey. The microscope shows each arm and spine to terminate in a minute but sharp hook. The animal, in moving, lifts itself on the extreme end of its long arms, standing, as it were, on tiptoe, so that "the ramifications form a kind of trellis-work all around it reaching to the ground, while the disk forms the roof." This latticed bower is but a trap for entangling heedless little fishes and shrimps, whose escape from those coils is as hopeless as the efforts of a fly to break loose from a spider's web.

BASNAGE DE BEAUVAL, JAQUES, the most distinguished of a distinguished French family, mostly supporters of the Protestant cause, was the son of Henry Basnage, an able advocate in the parliament of Normandy, and was born at Rouen, Aug. 8, 1653. Having studied theology at Geneva and Sedan, he became pastor of the Reformed church in Rouen (1676). That church being interdicted in 1685, Basnage obtained leave to retire to Holland, where he finally settled as stipendiary minister of the Walloon church in the Hague, having gained the friendship of the grand pensionary Heinsius. Here, while zealously discharging his religious duties, he was called upon to take an active part in state affairs, particularly in negotiating the defensive alliance concluded between France, England, and the states-general, 14th Feb., 1717. Amid all these duties and distractions, Basnage cultivated literature with ardor, and was no less distinguished for his extensive learning than for the polish of his manners and the integrity of his character.

Basnage, who commanded in a singular degree the esteem both of Protestants and Catholics, died on the 22d Sept., 1723.

His chief works, which have been frequently laid under contribution without being named, are *La Communion Sainte* (Rott., 1688), a work approved even by Catholics, and often reprinted; *Traité de la Conscience* (Amst. 1696, 2 vols.); *Histoire de l'Eglise* (Rott. 1699, 2 vols. fol.); *Histoire des Juifs* (Rott. 1706, 5 vols.), one of Basnage's best productions, and translated into English by Th. Taylor (Lond. 1708); *Dissertation Historique sur les Duels et les Ordres de Chevalerie* (Amst. 1720).

BASQUE PROVINCES, a district of Spain, in lat. 42° 25′ to 43° 28′ n., and long. 1° 44′ to 3° 25′ w., and comprising the three provinces of Biscay, Guipuzcoa, and Alava, which constituted the ancient *Cantabria*. They form a sort of triangle, the base of which is the bay of Biscay on the n., and the apex the town of Logrono in the s.; the boundary-lines of Navarre on the e., and Santander and Burgos on the w., forming the two sides. The total area of the provinces is about 3000 sq.m., and the population in 1870, 471,989. The surface of the B. P. is very mountainous, particularly that of Alava, which is everywhere cut up into deep narrow valleys by offsets from the main chain of mountains. The rivers of Biscay and Guipuzcoa, none of which are important, empty themselves after a short course into the bay of Biscay; those of Alava flow down the opposite slopes into the Ebro, which carries their waters to the Mediterranean. The climate in all the three provinces is, on the whole, mild and salubrious. The general aspect of the country is very picturesque, the hills in most cases being covered with wood to the very summit. The principal trees are oak, beech, and chestnut. The fruit of the chestnut forms an article both for diet and of export. The soil in the valleys and plains, though not very rich, has been rendered productive by the energy of the people, who spare no labor in the cultivation. But as yet, science and machinery have done little or nothing to assist nature and manual exertion. A spade, or prong-fork, is the chief mechanical aid the Basque peasant has. The farms are small, usually only about four or five acres, and rarely more than can be managed by the farmer and his family. Notwithstanding, the roads and agriculture of these provinces contrast very favorably with those of Spain generally. The products are wheat, barley, maize, flax, hemp, etc.; the wheat, however, only ripening in the most favored localities. Iron is found in abundance; also copper and tin, marble, porphyry, and jasper. The fisheries on the coast are productive.

The Basque race is not confined to the B. P., or to the southern side of the Pyrenees. The greater part of the inhabitants of Navarre (q.v.) are pure Basques. And on the French side of the Pyrenees, three cantons of the department Basses Pyrénées, with a pop. of 145,000, are inhabited by Basques, who, though they retain their own tongue, have not so fully preserved the characteristics of the race as their Spanish brethren.

The Spanish Basques are a simple, brave, and independent people, willing to undergo any hardships rather than surrender their mountain-freedom. None of their many invaders were ever able to effectually subdue or expel them. The B. P. retained till 1876 a separate constitution, guaranteeing them many political and fiscal privileges not possessed by the rest of Spain (see FUEROS). But on the suppression of the Carlist insurrection, which had all along its stronghold in the B. P. and in Navarre, the old immunities were abolished. The Basques are even prouder than Spaniards, and the mere fact of being born in their territory secures the privilege of "universal nobility." *Euscalduna* is the name the Basques give themselves; their country they call *Euscaleria;* and their language, which is peculiarly their own, *Euscara*—the prefix *Eusc* being "the old *Osc, Vesc, Vasq* of Italy and Iberia." The origin of the Basques is doubtful. Humboldt considers them descendants of the ancient Iberi, who once occupied the whole of the peninsula, and spoke the language now confined solely to the B. P.; while Mr. Borrow's opinion is, that the language is of Tartar origin. The Basques are fond of music, and on their chief holiday, Sunday, they indulge in singing, dancing, and single-stick, which they enjoy immensely. For a more particular account of the B. P., we would refer to that excellent manual, *Ford's Hand-book of Spain.*

BAS-RELIEF. See ALTO-RILIEVO.

BAS-RHIN, now a part of the German territory of Alsace-Lorraine; but once a department of France.

BASSE, *Labrax*, a genus of sea-fishes of the perch (q.v.) family, distinguished from the true perches (*perca*) by having the tongue covered with small teeth. The species are found on the shores both of Europe and America. The only British one is the common B. (*L. lupus*), a fish which in its fins, scales, etc., much resembles a perch, but has a more elongated and salmon-like form. It is pretty abundant on some parts of the British coasts, and is not unfrequently taken by angling from the rocks, or by small seine-nets on sandy shores; often, also, by the hand-line and by the long line. It is a strong, active fish, and was well known to the ancients; *labrax* is its Greek name; the Romans called it *lupus* (i.e., wolf), from its remarkable voracity. It is much esteemed for the table. It sometimes attains a large size, 15 lbs. or more in weight, but is generally much smaller. It not unfrequently ascends rivers to some distance, and the experiment of keeping it in a fresh-water pond has even been tried with success.—The striped B., or rock-fish of the United States (*L. lineatus*), very nearly resembles the common B., but attains a larger

size, and is marked by seven or eight longitudinal black lines. The name stone B. is given to the *polyprion cernium*, a fish very rare on the coasts of Britain, but abundant in more southern parts of the Atlantic ocean, as far as the cape of Good Hope, and found on the American coasts and in the Mediterranean. In general appearance it resembles the common perch more nearly than the B., but differs from both in having only a single elongated dorsal fin. It sometimes follows ships of which the bottom is covered with barnacles, is easily taken, and is esteemed excellent for the table.

BASS, *Labras*, a family of fresh-water and sea fishes, abundant in the United States. The sea-bass, *centropristis nigricans*, never comes into fresh water. Its general color is blue black, and the black edges of the scales give its surface a netted appearance; fins pale blue, the anal and dorsal spotted with darker. Teeth are set over all the bones of the mouth. Its weight is very rarely as much as 17 lbs. The striped bass, *labras lineatus*, is the rock fish of the Delaware and Potomac. Color, bluish brown above, silvery below, with seven stripes of chocolate brown. This fish in spring pursues the smelt into shallow water, and devours the spawn of the shad. Its weight reaches 50 to 70 lbs.; it is excellent food, and furnishes choice sport for the angler. A variety which has the lateral bars broken into spots is *L. notatus*, or the bar-fish. The black bass of the lakes, *grystes nigricans*, is blue-black, marked with darker bandings. It frequents all western waters from the St. Lawrence to the Mississippi. Its weight runs to 8 lbs. It is a favorite both before and after it is caught. The Oswego bass, *G. megastoma*, often confounded with the black bass, is distinct by the greater size of its mouth. It is taken in the shallow waters of lake Erie. The white bass, *G. multilineatus*, or white perch, abounds in all the upper lakes. The grass bass, *centrarchus hexacanthus*, is found in company with the Oswego bass. Its weight rarely exceeds 2 lbs. The rock bass, *C. æneus*, is dark copper yellow, with darker clouds; fins bluish green. It is common in the St. Lawrence, in the canals, and in the Hudson. The growler, *grystes salmonus*, is the white salmon of the southern states. Color, deep bluish green, with 25 or 30 longitudinal dark bands.

BASS. See BASE.

BASS, or BASSWOOD. See LIME, or LINDEN.

BASS, EDWARD, D.D., 1726-1803; b. Mass.; graduate of Harvard; ordained in England by bishop Sherlock in 1752, and in 1797 consecrated first Protestant Episcopal bishop of Massachusetts, his diocesal functions being afterwards extended over New Hampshire and Rhode Island.

BAS'SA, or BAF'FA, an excellent port on the Grain coast, Guinea, formerly much resorted to by trading vessels for coarse pepper; latterly for slaves. The country around produces lemons, oranges, and bananas in abundance.

BASSA'NO, a t. of Italy, in the province of Vicenza, 19 m. n.e. of the city of Vicenza, on the Brenta; pop. '71, 7769. It is situated on a rising ground in an extensive plain, and has a considerable trade in wine, olives, silk, leather, etc., as well as a great printing establishment. It has 30 churches, and a number of fine palaces. One of its gates, the work of Palladio, is greatly admired. It is famous for a victory of Bonaparte over the Austrian field-marshal, Wurmser, on 8th Sept., 1796, and was the scene of other battles between the French and Austrians in the wars of that period.

BASSA'NO (or, more properly, GIACOMO DA PONTE), an artist of great eminence, was b. at Bassano, in the n. of Italy, in 1510. He was first educated in the principles of his art by his father, Francesco da Ponte, who was himself a painter of considerable merit, and afterwards visited Venice, where he became a pupil of Bonifazio Veneziano. Here he enjoyed opportunities of studying the designs of Parmegiano, Titian, Tintoretto, and others. The earlier stages of his professional career clearly indicate that these great painters had kindled a rich and emulative enthusiasm in B., for his works display a loftier genius, both as regards conception and execution, than at a later period. His principal effort, belonging to this higher epoch, is a fresco painted on the front of the house of the Michelli family. It represents Samson destroying the Philistines; the figure of the mighty Israelite being considered not unworthy of Michael Angelo. After his father's death, he returned to Bassano, where he devoted himself to a simpler style of art. From this time, however, dates his celebrity. He may even be said to have founded a school, whose peculiarity was the delineation of common things, markets, fairs, country inns, farm-yards, etc. He had a passion for introducing cattle into his pictures, even under the most inappropriate circumstances. The special merits of this lower style, into which B. finally lapsed, are its vigorous and picturesque coloring, and its accurate imitation of nature. B.'s landscapes, however, betray a comparative ignorance of perspective. Occasionally, during his later years, B. showed that his early love of the sublime was not wholly extinguished, by painting several altar-pieces, which exhibit a noble grandeur of execution, such as the "Entombing of Christ," in the church of St. Maria. Padua; a "Nativity," now in the Louvre, Paris; "St. Roche interceding with the Virgin for a People infected with the Plague," at Vicenza; "The Wise Men's Offering," and the "Seizure of Christ in the Garden." His rural pictures are abundant in the Italian galleries and in English collections. B. also painted heads of several of his contemporaries, Tasso, Ariosto, etc., and was in high favor with the emperor Rudolph II., for whom he

also executed several works. He d. in 1592. He left four sons, who all followed their father's profession, but were not marked by any special originality of manner.

BASSA'NO, HUGUES BERNARD MARET, Duke of, 1763–1839; a French statesman. At the commencement of the revolution he edited the *Bulletin* (the original of the *Moniteur*), containing the proceedings of the constituent assembly, a position which gave him much political influence. In 1791, he was at the head of a bureau in the ministry of foreign affairs, and was sent to England to re-establish suspended diplomatic relations, but he was unsuccessful. In 1793, he was appointed ambassador to Naples, but while on his way was captured by the Austrians, and kept two years a prisoner, being finally exchanged for the daughter of Louis XVI. In 1797, he was one of the negotiators of peace with England. Bonaparte employed him as his private secretary, and he afterwards became secretary of state, in which position he managed the newspapers and exercised great influence over Napoleon, assisting in all his diplomatic business. In 1811, he had direction of foreign affairs; Napoleon made him duke of B., and retained him as his most intimate adviser. He was in exile during the restoration, but Louis Philippe restored him to the peerage in 1831, and for a short time he acted as president of the cabinet.

BAS'SARIS, a genus of animals in North America representing the civet of Europe. They are about as large as common cats, and may be easily tamed. They live in trees, and catch birds, mice, etc. The tail is bushy, and marked with rings like that of the raccoon.

BASSE-CHANTANTE, in music, the higher of the two basses in a score, partaking of more melody, and performed by the violoncello.

BASSE-CONTRAINTE, a French term in music, meaning a bass melody of a few bars repeated throughout the piece, while the other parts vary.

BASSEIN', the name of two cities in India.—1. B., *in Pegu*, the capital of a district of the same name, stands on the left bank of an arm of the Irrawaddy, which joins the bay of Bengal a few miles to the s. of Cape Negrais. It lies in lat. 16° 45′ n., and long. 94° 50′ e.; and though it is 90 m. from the sea, yet it is easily and safely accessible to the largest ships. In a military view, also, the place is important, as it completely commands the navigation of the stream. It was captured by the British in 1852. Pop. '72, 20,688. The district of B. has an area of 8954 sq.m., and a pop. of (1872) 316,833.—2. B., in the *presidency of Bombay*, is situated on an island of the same name; lat. of the island, 19° 20′ to 19° 28′ n., and long. 72° 48′ to 72° 54′ e. It appears to be the mere wreck of former grandeur, having been found by bishop Heber, in 1825, with many churches and convents, to be altogether uninhabited and desolate. In 1534, it was ceded to the Portuguese; in 1765, after a possession of 231 years, it was wrested from them by the Mahrattas; in 1780, it surrendered to the British, after a regular siege of 12 days. The island, which contains about 35 sq.m., is separated from the continent by a narrow channel, which, as a shelter for shipping, constituted its value in the eyes of the Portuguese. Historically, B. is of some interest, having been promised, though never delivered, as part of the dowry of Charles II.'s Portuguese consort.

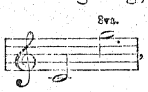
BAS'SES, two ledges of rocks to the s.e. of Ceylon, distinguished as *Great* and *Little* —the former group being more to the s.w., and the latter more to the n.e. They lie in n. lat. 6° 11′ to 6° 26′, and in e. long. 81° 40′ to 81° 59′. Their importance arises merely from their position, which is in a great thoroughfare of traffic.

BASSES-ALPES, a department of France on the Italian border, 2685 sq.m.; pop. '76, 136,166. It is sparsely populated, only 20 persons to a square kilo; watered by the Durance; mountainous, with good pasturage, and famed for raising plums. Chief town, Digne.

BASSES-PYRÉNÉES, a department of France bordering on Spain and the bay of Biscay; 2943 sq.m.; pop. '76, 431,525. The rivers are the Nive, the Odour, and the Bidouze. About half the surface is marshy. There are mineral springs of value, and much industrial activity; trade is carried on through the city and port of Bayonne. Capital, Pau.

BASSE-TERRE, a French term, equivalent to the English *lowlands*, or, rather, *lowland*, appropriately applied to several localities in the West Indies.—1. The capital of St. Kitt's, on the w. coast, in lat. 17° 17′ n., and long. 62° 42′ west. It is a low, hot, dusty place, standing at the outlet of a lovely valley of the same name. Its pop. is about 9000, and its trade, as the port of the island, is considerable. The designation of the valley and town is a memorial of the former occupation of the half of St. Kitt's by the French.—2. The capital of Guadeloupe, giving its name to the larger of the two islets into which Guadeloupe is divided by an arm of the sea, known as Salt river. B. stands on the s.w. coast, in lat. 16° n., and long. 61° 44′ w., having nothing worthy of the name of harbor, but merely a roadstead. It contains about 13,000 inhabitants.—3. The chief town of Marie Galante, a dependency of Guadaloupe, which is about 12 m. to the n.w. It is otherwise ambitiously called Grand Bourg.

BAS'SET HORN (corno di basetto), the richest and softest of all wind-instruments, invented in Passau, in 1770, improved by Lotz in Presburg, in 1782. It is similar to a

clarionet in tone and fingering; its compass is two and a half octaves, the notes written for it being from 

, but the instrument sounds a fifth lower than the notes are written.

BAS'SI, LAURA MARIA CATERINA, 1711-78; an Italian lady of Bologna, distinguished for learning. She received a doctor's degree, and was made professor in the philosophical college, where she lectured on experimental philosophy until her death. She was a member of many societies, and conducted an extensive correspondence with eminent men of learning; was well acquainted with the classics, and also with the literature of Italy and France. In 1738 she married Dr. Guiseppe Verrati.

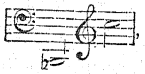
BAS'SIA, a genus of plants of the natural order *sapotaceæ* (q.v.). The species are trees, tropical or sub-tropical, the flowers of which are remarkable for their fleshy corolla, and for the abundance of oil or butyraceous fat which the seeds contain, and which is used for many purposes by the inhabitants of the countries to which they are indigenous. The fruit has a pulpy rind, and three or four one-seeded cells. The ovary has eight cells; but some of them are always abortive. The BUTTER-TREE, described by Mungo Park as growing in the interior of Africa, in the country of Bambarra, has been supposed to belong to this genus, and named *B. Parkii.* According to the eminent botanist, Robert Brown, however, the seed of the butter-tree, as figured by Park, scarcely belongs to the genus B., but rather to the nearly allied genus *vitellaria* or *lucuma.* It produces the *galam butter,* also called *shea butter* (i.e., tree butter), which is highly valued, and forms an important article of internal commerce in the interior of Africa. The seeds of the fruit, which resembles an olive, are dried in the sun, or in a peculiar kind of oven, and the kernels are then boiled in water, in order to obtain the butter from them, which not only keeps for a whole year without salt, but is also whiter, more solid, and more pleasant to the taste than the butter of cows' milk. This butter is used both as an article of food and of medicine. It has been supposed that the introduction of this tree might be of great importance in other tropical countries.—The MADHUCA, MAHWA, or MAHOWA tree of the East Indies (*B. latifolia*) is described as resembling a good oak in size, and is a valuable timber-tree. It is found in the mountainous parts of the Circars, Bahar, Bengal, etc. Its flowers are eaten raw, and a kind of arrack or spirit is distilled from them. The seeds yield, by expression, a considerable quantity of a concrete greenish-yellow oil, which is used for lamps, and occasionally for frying articles of food.—The Indian BUTTER-TREE, or PHULWARA or FULWA TREE (*B. butyracea*), is found in some of the more mountainous parts of India, and attains a height of 50 feet. Its timber is light and of no value. The leaves are 6 to 12 in. long. The fruit is of the size of a pigeon's egg, and although eaten, is not much esteemed; but from the seed, a concrete oil or butter is obtained, by expression, of a delicate white color, much valued for medicinal uses, and as an unguent.—The seeds of the ILLUPIE-TREE, or Indian OIL-TREE (*B. longifolia*), a native of Coromandel, yields a large quantity of oil, which is used for lamps, for soap-making, and in cookery. The flowers are much esteemed for eating; and the wood is almost as hard and durable as teak.

BASSIM, a t. of India in the district of that name in the province of Berar Pop. in 1872, 8531.

BASSINET. See HELMET.

BASSOMPIERRE, FRANÇOIS DE, Marshal of France, was b. in 1579, at Harnel, in Lorraine. Belonging to one of the oldest French families, he came, at the age of 20, to the French court, where he gained the favor of Henry IV. After the murder of Henry IV., he attached himself to the party of the queen, who appointed him col. of the Swiss guards; but on the murder of Concini, he sought to establish himself in the favor of the young king, and when the quarrel broke out betwixt mother and son, he particularly contributed to the overthrow of the former. He was raised to the rank of marshal of France in 1622; was sent on embassies to Spain, Switzerland, and England; was actively employed in the siege of La Rochelle; took the pass of Susa by storm in 1629; and commanded for a little while the troops raised in Languedoc against the Huguenots. He beecame, however, an object of suspicion and dislike to Richelieu, who caused him to be cast into the bastile in Feb., 1631, from which he was not liberated until the death of Richelieu, in 1643, after he had been 12 years imprisoned. He d. in 1646. He was an accomplished courtier, extravagant, and excessively addicted to gallantries. At the time of his arrest, he destroyed 6000 love-letters. His *Mémoires* (2 vols., Cologne, 1665; 4 vols., Amst., 1723), written in the bastile, are rendered interesting by their spirited style.

BASSOON (Ital. *fagotto*), a well-known wind-instrument of the reed species, made of maple-wood or plane-tree. The B. is an Italian invention; its name fagotto, meaning *a bundle,* probably from its being made in different pieces laid one against the other. The French call it *basson de hautbois;* the Germans retain its Italian name. Its invention is attributed to Canonicus Afranio, in Ferrara, in 1539. In the middle of the 16th c., it had already reached great perfection. Sigmund Schnitzer, in Nuremberg, who d. in 1578, was a celebrated maker. The B. consists of a bored-out tube of wood in several pieces,

fixed together alongside each other, so as to bring the holes and keys within the reach of the fingers of each hand. The B. has, in general, not less than 8 holes and 10 keys. In the narrow end of the wooden tube is fixed a small tapering brass tube in the form of an S, on the end of which is placed the reed for producing the tone. The compass of the B. is from , but the best tones are those from . The lowest C sharp, and B natural, are wanting. The notes for the B. are written on the bass clef for the lower part, and on the tenor clef for the higher. The best keys for the B. are E flat, B flat, F, C, G, D, and A; all the other keys are more or less difficult. For military bands there are different sizes of bassoons—one a fourth lower; another, the contra B, an octave lower; and a third, the tenor B, a fifth higher—all of the same construction. The best instruction books for the B. are by Almenräder, Fröhlich, Ozi, and by the Paris conservatorium. B. is also the name of an organ-stop, the pipes of which are made to imitate the tones of the instrument.

BASSORA, Bussora, or Basrah, a t. of Asiatic Turkey, pashalic of Bagdad, is situated on the western bank of the Euphrates, here called the Shat-el-Arab, about midway between the mouth of the Tigris and the Persian gulf, from which it is 70 m. distant. Lat. 30° 30′ n., long. 47° 34′ e. There are many gardens within the walls of the city, and many plantations of roses around it, but it is very dirty. The river, which is navigable up to B. for ships of 500 tons, is there divided into a number of channels, and by evaporation and frequent overflowing makes the climate very unhealthy. The inhabitants, once 150,000, now only 5000 in number, are for the most part poor Arabs and Persians; the officials and military alone are Turks. Commerce is in the hands of Armenians. Most of the houses are low huts, built of unburned bricks. An extensive trade is carried on in the exchange of the productions of Turkey and Persia with those of India, and also in European goods, particularly articles of British manufacture. Amongst the exports are strong and beautiful horses, and dates, which are grown in great abundance. Caravans travel to Persia, and also by Bagdad and Aleppo to Constantinople. It has steam communication with Bombay and Bagdad. To guard against the incursions of the Arabs, a wall of about 9¼ m. in length has been erected in the neighboring desert, at all the gates of which a watch is maintained. B. was founded in 626 by the caliph Omar, and soon became one of the most famous and opulent cities of the east. The possession of it has been the subject of many contests between the Turks and the Persians. It is a place of great note in the history of Arabic literature.

BASSORA GUM, a whitish or yellowish-opaque substance resembling gum-arabic, but differing from it by being mostly insoluble in water. Its source has not been satisfactorily ascertained.

BASSO-RILIE'VO. See Alto-rilievo.

BASS ROCK, a remarkable island-rock near the mouth of the firth of Forth, about 2 m. from Canty bay, Haddingtonshire, opposite the ruined castle of Tantallon. It is composed of hard granular greenstone or clinkstone, and is about a mile in circumference, nearly round, and 400 ft. high. It is inaccessible on all sides except the s.w., where it shelves down to the water, and there the landing is difficult, and almost impossible, when there is any swell. On the w., n., and e., the precipices rise perpendicularly out of the sea, to a great elevation. These are the abode of immense numbers of solan geese (it is estimated that 10,000 to 15,000 of these fowls resort here annually) and other aquatic birds, which give to the surface of the precipices a snowy appearance in the distance. A cavern traverses the rock from w. to e., and is accessible at low tide. There is a spring on the island, and a few sheep are pastured on it, the mutton of which is much prized. How early the Bass was tenanted, is doubtful; but there is a tradition to the effect that St. Baldred resided on it as early as the 7th century. It is also not very certainly known when the Bass was first fortified, but it formed a retreat for the son of Robert III., afterwards James I. of Scotland, before his nineteen years' captivity in England. James VI. visited the Bass in 1581, and was anxious to obtain it for state purposes; but its owner, "Lauder of the Bass," refused to part with it. The registers of the church of Scotland were sent to the Bass in 1651, for preservation from Cromwell; but the protector forced their surrender in the following year. In 1671, Charles II. purchased the rock for £4000, and within its dreary dungeons many of the most eminent of the Covenanters were confined during that and the following reign. It is a somewhat curious fact that the Bass was the last spot in the British islands which held out for the Stuarts. A mere handful of adventurers in the Jacobite interest, 24 in number, had the address to capture the island, and to retain it in name of king James, from June, 1691, till April, 1694, against all the forces which the government of William III. sent against them; at last, the spirited little garrison surrendered on honorable terms, and only from a consciousness of failing provisions. For an account of this romantic incident, see *Pictorial History of England*, vol. iv. p. 16, new edition. In 1701, the fortifications were demolished by order of William III. Five years afterwards, the Bass passed into the possession of Sir Hew Dalrymple, to whose lineal descendant it now belongs.

The king of the Belgians (then prince Leopold) visited the rock in 1819, and three years afterwards, George IV., on passing it on his voyage to Scotland, was honored with a royal salute from some guns then on it. It has also been visited by the prince of Wales. The Bass is let to a "keeper," who pays a considerable sum for it annually, the rent being made up by young geese, which are used as food; by eggs, feathers, and oil; also by fees exacted from visitors to the rock. There is an interesting volume on the Bass, historical, geological, and botanical, the joint production of Dr. M'Crie, jun., Hugh Miller, and professors Fleming and Balfour.

BASS ROCK, an island of stone near the firth of Forth, Scotland, about a mile in circumference, and 400 ft. high, traversed by a cavern. The rock is accessible only on the s.w. side. It is a favorite haunt of aquatic birds. Charles II. bought the B.R. for a prison for Covenanters; and a few partisans of James II. held it nearly three years against frequent attempts at capture by large bodies of Protestants.

BASS'S STRAIT separates Tasmania from Australia. It contains many islands, chiefly in its southern section, and is greatly beset by coral-reefs. It runs almost due e. and w., has an average breadth of about 200 m., and is pretty nearly bisected by the parallel of 40°.

B. S. deservedly bears the name of its explorer, who, without having been professionally a seaman, is entitled to a very high place among maritime discoveries. After having made shorter excursions from Port Jackson, in a mere wherry of 8 ft. in length, Mr. Surgeon Bass resolved to settle, in a whaling-boat, the question as to the connection or separation of New Holland and Tasmania. In his frail craft, he penetrated as far as Western Port, near the entrance of Port Phillip, where, from the trending of the land and the swell of the sea, he inferred that he had most probably reached the open ocean. He did not rest contented, however, until, in a tiny bark of 25 tons, he actually circumnavigated Tasmania. The discovery, so deliberately prosecuted, and so satisfactorily completed, soon proved to be fertile of results; for in 1802, only four years after the exploration of Bass, Port Philip was entered; in 1804, Tasmania was colonized; and now the strait is the highway for a trade of more than a million sterling between Victoria and Tasmania—a trade which has very recently received an additional impetus from the laying of a telegraphic cable between the two colonies at their joint expense.

BASSUTOS, a tribe of the Bechuanas in s. Africa, estimated 100,000 in number. They have made some progress in agriculture and civilization under the influence of French missionaries. In 1836, the B. were obliged to cede a part of their territory to Orange Free state, and in 1868 the remainder was united with Natal.

BAST, or BASS, also called *inner bark*, *liber*, or *endophlœum* (see BARK), the fibrous inferior layer of the bark in the stems of exogenous plants, which is particularly conspicuous in exogenous trees, as a peculiar substance interposed between the true bark and the wood. It consists in great part of sap-vessels (laticiferous vessels, see LATEX and SAP) lying close together, and assuming the appearance of tough fibers. In a fresh state, it has generally a whitish color; and it is often composed of several layers, to which, however, the collective name of bast-layer is very often applied. The uses of this part of plants in the arts are very numerous; the fibers of hemp, flax, jute, etc., are nothing else than bast. The name B., however, is more commonly applied to the inner bark of trees, and is originally Russian, designating the inner bark of the lime-tree (q.v.) or linden-tree, which is employed for making a coarse kind of ropes, mats well known as bast-mats, and a kind of shoes much worn by the Russian peasantry. The trees are cut when full of sap in spring. For B. to be plaited into shoes, young stems of about three years old are preferred; and it is said that two or three are required to make a single pair of shoes. Trees of six or eight years old are cut down for the better kind of mats, which are exported in large quantities from Russia, and particularly from the port of Archangel, and so much used for packing furniture, for covering tender plants in gardens, supplying strands with which plants are tied, etc. The trees from which the B. is taken are very generally burned for charcoal. After the bark is dried, its layers are easily separated by steeping in water. The finest layers are the inner, and the coarser are the outer ones.—The manufacture of bast-mats is nearly confined to Russia and Sweden. Not fewer than 3,500,000 are annually exported from Russia, and from 500,000 to 800,000 are annually imported into Britain. A few are made in Monmouthshire. Lime-tree B. is used in the s. of Europe for making hats. The name bast-hat is, however, very often given to a hat made of willow-wood planed off in thin ribbons, and plaited in the same manner as straw-hats. The inner bark of *grewia didyma*, a tree of the same natural order with the lime-tree, is used for making ropes in the Himalaya mountains.

BASTARD BAR. In popular speech we frequently hear of a *bar-sinister*, as a mark of bastardy. But a bar-sinister, strictly speaking, is an impossibility, inasmuch as the bar (q.v.) is not formed of diagonal but of horizontal lines. A bend-sinister (q.v.), which, by the French, is called a bar, has with more reason been confused with the true mark of illegitimacy, and has on that account been avoided even by heralds. But the real B. B. differs very essentially from the bend-sinister, being half of the scarp, which again it half of the bend-sinister. "The half of the scarp," says Nisbet, "with the English, is

called a baton-sinister; by the French, baston-sinister; it is never carried in arms but as a mark of illegitimation, commonly called the bastard bar." In modern practice, the baton does not touch the extremities of the shield, or of the quarter in which the paternal arms are placed, but is *couped*—that is, cut short at the ends. In this form the baton, when used as a mark of illegitimacy, is placed over the paternal coat of the bastard, whether used singly or in a quartered shield. Nisbet informs us that the baton-sinister, both in England and Scotland, is comparatively of modern invention, natural children in earlier times not having been permitted to assume the arms or even the names of their fathers. "The unlawful children of John of Gaunt, duke of Lancaster, begot on Katharine, daughter of sir Payen Roat Guyn, king of arms, did not carry the arms of their father the king, though nobilitate, with a baton-sinister, as now used; . . . but after the legitimation of these three natural sons by act of parliament, they then assumed the sovereign ensigns of England, within a bordure gobbonated (q.v.), argent and azure."

According to the practice of France, which probably was followed in England also, the bastard could not cancel or alter the baton without the consent of the chief of the family, or the authority of the sovereign. Even where the baton was not removed, it was common for the sovereign to grant his permission to carry it *dexter*, in place of sinister. Charles VII. of France allowed John, the bastard of Orleans, for his valor against the English, to turn his sinister traverse to the dexter, with which he and his issue afterwards *bruised* the arms of Orleans, as dukes of Longueville. The same privilege was granted to James, earl of Murray, natural son of king James V. of Scotland, by his sister queen Mary, and he thenceforth carried the lion and tressure of Scotland thus bruised, quartered with the feudal arms of the earldom of Murray. The general practice of the milder heraldry of our own day is to substitute the gobbonated bordure for the B. B., not only in the case of the legitimate children of bastards, but of bastards themselves.

BASTARD EIGNÉ is the name given in English law-books to an eldest son illegitimate by birth, but whose father and mother were subsequently married, and had other children born in wedlock. See BASTARDS AND BASTARDY.

BASTARDS and **BASTARDY.** Bastards, as described by Blackstone, are such children as are not born either in lawful wedlock, or within a competent time after its determination. The Scotch lawyers, again, true to their peculiar law of marriage, define a bastard as a child born of a woman, who was not married to the father at the time of conception, *and who was never thereafter married to him.* It was at one time the law of England, when divorces *a mensa et thoro* were adjudged by the ecclesiastical courts, that if the wife had children during the legal separation occasioned by the former kind of divorce, such children were *primâ facie* bastards—for the law presumed the parties to live conformably to the sentence of separation. But in modern times, the presumption has changed, and now always favors legitimacy.

Bastards are incapable of inheriting real property; nor can they claim any share of personal estate as next of kin to a party dying intestate. They are said to be *filii nullius*, or *filii populi*, the sons of nobody, or the sons of the people, having no inheritable blood in them. As laid down, however, in many authorities, and among others in the last (4th) edition of Stephen's *Commentaries*, there is an exception to this rule in the case of a bastard *eigné* and *mulier puisné*, and where, it may be observed, the principle of the Scotch law of legitimation appears to some extent to be admitted. Thus, where a man has a bastard son, called a *bastard eigné* (q.v.), and afterwards marries the mother, and by her has a legitimate son, who, in the language of the law, is called a *mulier puisné*—if the father dies, and the *bastard eigné* enters upon his land, and enjoys it to his death, and dies seized thereof, whereby the inheritance descends to his issue, the *mulier puisné* and all other heirs are totally barred of their right, because the laws of England pay such a regard to a person in the situation of the *bastard eigné*, that after the land had descended to his issue, they would not unravel the matter again, and suffer his estate to be shaken. But this indulgence was shown to no other kind of bastard; for if the mother was never married to the father, such bastard could have no colorable title at all. And the above exception would almost appear to be the law of England at the present day. But a recent statute renders this opinion somewhat doubtful, for by the 3 and 4 Will. IV. c. 27, s. 39, it is enacted that no *descent cast*, after the 31st day of December 1833, shall defeat any right of entry or action for the recovery of land. By descent cast is meant an heir of a party who had contrived illegally to enjoy the land without challenge during his life, and was thereby enabled to transmit it to his heir, who thenceforward had a title which could not be impeached either by the original rightful owner, or by any of his descendants. The above statute, however, has cut off the rights in this behalf of all such descents cast, and the true owner can now, under the provisions of the act, always recover. But is the son of a *bastard eigné* such a "descent cast" as is contemplated by the 3 and 4 Will. IV. c. 27? It may be doubted whether he is. The expression "descent cast" is generally applied in law-books to the case of a *stranger* who, under a forcible, wrongful, and illegal entry on the land, had succeeded in diverting the inheritance from the direct and original channel. But such is not the position of a *bastard eigné*. He is not, in any sense of the word,

a stranger; nor is the above privilege or favor allowed him and his family at all in respect of his position towards, or of anything that can be called his title to the *land*, but such privilege and favor are given him solely because of his *peculiar bastardy*. In fact, it is just because he is *not* a stranger, but his father's eldest son by birth, that the law from ancient times decided that he should not be altogether deprived of what otherwise would have been his natural rights. The rule, as we have suggested, appears to be founded on the principle of the Scotch law of subsequent legitimation; and the intention probably was to give effect to the good feeling of the second or other legitimate son, who, from a regard to his mother's character, as well as his brother's position, might find himself excused from asserting his claims. Whether the above statute can, by its general terms, be understood arbitrarily to alter such a reasonable and natural law of family succession, is a question for lawyers and law-courts. The point, however, is important for popular explanation. In all other cases, the law of England appears to be as distinct as it is severe. It has even been decided that a child born before wedlock in a foreign country, and according to whose law such child was legitimate, could not inherit land in England where his bastardy was indelible.

There can be no collateral succession through bastards; for as they cannot be heirs themselves, so neither can they have any heirs but those of their own bodies. A bastard is not entitled to the name either of his reputed father or of that of his mother, though he may acquire for himself a surname by reputation; nor can he take property by the mere description of *child* of his reputed parent, until he has acquired the reputation of standing in that relation to him. Nor does a bastard follow, as legitimate children do, his father's place of parochial settlement under the poor-laws, but he has and follows the settlement of his mother until he attains the age of 16, or until he acquires a settlement in his own right, and after that age his primary settlement is in the parish where he was born. Another peculiarity of the status of bastardy is, that a bastard being *filius nullius*, the consent of his father or mother to his marriage is not required, and is of no avail; but a guardian may be appointed by the court of chancery for the purpose, or a license may be granted upon oath made that there is no person authorized to give consent. To this may be added, that although in general a father may by deed or will appoint a guardian for his infant child, in the event of his decease, he has no such privilege if the child be illegitimate.

Such may be stated to be the principal peculiarities attaching to bastardy in the law of England. In other respects, a bastard is very much in the same position as a legitimate person. Thus, he can hold land in fee-simple, and can dispose of it as he may think proper, making an unlimited alienation of it; and of course he can make a will bequeathing his whole estate; a simple and reasonable privilege, however, which, strange to say, was not conceded to bastards in Scotland dying without lawful issue, till the year 1836, when an act of parliament was passed, the 6 Will. IV. c. 22, which, on the preamble that "it was just, humane, and expedient," empowered bastards in that country to dispose of their personal property by testament or will in like manner as other persons might do, any law or practice to the contrary notwithstanding! In regard to his whole estate, although the crown is entitled to such in the case of a bastard dying intestate, the royal claim is not strictly enforced; but upon petition, the crown's right will be transferred to the nearest member of the deceased bastard's family. In the Scotch law, also, the crown may, by what is called a *gift of bastardy*, grant not only the personal, but the real estate of an intestate bastard to the "donatory," or person similarly entitled, as in the case of personal property in England. It is also to be observed, that the prohibitions as to marriage which extend to collaterals, and to those related by the half-blood only, also apply although one of the parties be a bastard. Again, the laws relative to incest apply to a bastard with equal force as to others; the principle of the two latter points being that, although the bastard be *filius nullius* as to many civil consequences, his relationship to his natural parent is recognized for moral purposes. Of course, it need not be added that a bastard may be made legitimate by an act of parliament for all purposes, even for that of inheriting land, "as was done," says Blackstone, "in the case of John of Gaunt's bastard children by a statute of Richard II."

The paternity of a bastard or illegitimate child in England is ascertained by several statutes—7 and 8 Vict. c. 101, 35 and 36 Vict. c. 65, 36 and 37 Vict. c. 9; and the father is bound to make a proper allowance for the child's support till 16. But it is on the mother herself that the maintenance of the child in the first instance devolves. She is for this purpose entitled to its custody in preference to its father; and she is bound to maintain it as part of her family while she remains unmarried, or until the child attains the age of 16, or gains a settlement in its own right, or (being a female) is married; and in the event of the mother's marriage, the same liability attaches to her husband. If the mother be of sufficient ability to maintain the bastard, while he is so dependent on her, and neglect that duty, so that he becomes chargable to a parish, she is liable, by 7 and 8 Vict. c. 101 s. 6, to be punished under the provisions of the *vagrant act*. Whether the mother is of sufficient ability or not, she can, by affiliation proceedings, compel the father to pay a sum not exceeding five shillings a week till the child is 16 (35 and 36 Vict. c. 65).

Besides the points in the Scotch law to which we have adverted, it is to be observed

that in that system, the maintenance, or "aliment," as it is called, of illegitimate children, is a joint burden upon both parents. The mother is entitled to the custody of the child, but it does not appear whether she is to have such custody for any fixed time. It is in the discretion of the court of session to determine this, and it would seem that the period may vary according to circumstances, from 7 to 14 years. During this time, the father is bound to contribute his proportion of the expense; and if neither the father nor the mother can support the child, it must be maintained by the parish in which the mother has a settlement.

There is a nice and curious difference in the laws of England and Scotland as to the mode of ascertaining the paternity of a bastard child. According to the statutes we have referred to, that fact may be proved in England by the evidence of the mother, provided her statement is supported in "some material particular" by other testimony. But in Scotland, the order of the inquiry is reversed; the woman's evidence in that country being taken *last*, and only where the other and independent evidence amounts to what is called a *semiplena probatio*—that is, such evidence as induces a reasonable belief, although not complete evidence, in which case she is admitted to give what is called her *oath in supplement*.

Both in England and Scotland, the widow of a bastard, whether there be issue or not of the marriage, is entitled to dower, terce, *jus relictæ*, and all the other legal rights of widows. See LEGITIMACY, SEPARATION, DIVORCE, MARRIAGE, INHERITANCE, FEE-SIMPLE, SUCCESSION, ULTIMUS HÆRES, VAGRANTS, and SEMIPLENA PROBATIO.

BASTARDY, GIFT OF. See under the preceding article.

BASTARDY, DECLARATOR OF. This is a suit which may be instituted in the court of session in Scotland, for having it declared that the lands or effects which belonged to the deceased bastard, belonged to the donatory in virtue of the gift from the crown. The "defender," or person against whom the suit is formally brought, is the party who would have succeeded to the bastard, had he been legitimate. B. can also be judicially declared by a similar mode of proceeding at the suit of a party who has any other interest, or, indeed, any interest whatever, to have such illegitimacy determined.

By a recent act of parliament, the 21 and 22 Vict. c. 93, the same conclusion may be substantially obtained by the English proceeding, directed by the act in the court for divorce and matrimonial causes. The act in question, it is declared, may be cited for all purposes, as the "legitimacy declaration act, 1858."

BASTI'A, the former capital of Corsica, is picturesquely situated on the slope of a mountain, rising from the sea in the form of an amphitheater, in the north-eastern part of the island, in lat. 42° 42′ n., and long. 9° 27′ east. It has (1872) 15,580 inhabitants. The streets are narrow and crooked. It has a harbor suitable for small vessels, defended by a mole, at the mouth of which is a rock resembling a lion couchant, and designated "Il Leone." There is a considerable trade in leather, skins, wine, oil, figs, and pulse; and many stilettos and daggers are manufactured here, which are principally exported to Italy. Until recently, the printing-presses of B. were actively employed in the production of Italian publications that would not have been permitted to appear in that country itself. B. was founded in 1380 by the Genoese Leonel Lomellino. During last century it was oftener than once taken by the British. It was made, in 1791, the capital of the French department of Corsica, which rank was afterwards transferred to Ajaccio. It is the seat of the highest courts of the island.

BASTIAN, HENRY CHARLTON, b. England, 1837; an eminent physician and physiologist. He was admitted to the royal college of surgeons in 1860; was assistant curator in the museum of university college, London, 1860–63; professor of pathological anatomy in the same college, 1867, and in 1871 physician to the university college hospital. He has published *The Modes of Origin of Lowest Organisms*, *The Beginnings of Life*, and many contributions to medical and philosophical journals. He is recognized as an authority in the pathology of the nervous system. He has carefully studied the modes of origin of the lowest forms of life, and is now foremost in the school of heterogenists, or believers in the theory of spontaneous generation.

BASTIAT, FRÉDÉRIC, an eminent political economist, was b. at Bayonne on the 29th of June, 1801. His father was a merchant, and educated his son with a view to the same profession. After completing his studies, B. entered the commercial house of one of his uncles, established at Bayonne, and employed his leisure hours in the study of political economy. Circumstances called him into Spain and Portugal in 1840, where he took advantage of the opportunity afforded him to study the customs and institutions of these two countries, which have still much to learn before they can be on a footing of equality with other nations in matters of finance and political economy. His first appearance as an author was in 1844, when he published, in the *Journal des Economistes*, an article "On the Influence of French and English Tariffs on the Respective Futures of the two Peoples." It contained in germ B.'s theory of political economy, who, from that moment, was a decided opponent of the system of protection. Subsequently, in the same journal, he combated the economic fallacies of socialism and the rights of labor. During a visit to England, he made the acquaintance of Cobden, and on his return to

France, he translated, 1845, the speeches of the free-traders, which he published with an introductory preface, entitled *Cobden and the League, or the English Agitation in Favor of Free Trade*, in which he gathered up into one solid mass the inconveniences of the protective system. B. now went to reside in Paris, where he continued to propagate his views with considerable success; he became secretary of the societies, and chief editor of the journal established to vindicate the principles of free trade. After the revolution of 1848, he was elected successively a member of the constituent and legislative assemblies. In 1850, he came forward as the antagonist of the socialist writer, Prudhon. Suffering from pulmonary disease, he repaired to Italy for change of climate, but died at Rome on the 24th Dec. 1850.

Besides the writings mentioned, B. published *Sophismes Economiques—Propriété et Loi, Justice et Fraternité—Protectionisme et Communisme, Harmonies Economiques*, and several other important tractates, all of which exhibit extensive knowledge of the subjects discussed, convincing logic, and a power of sprightly and biting satire. The *Harmonies Economiques* has been translated into English by P. J. Stirling (*Harmonies of Political Economy*, Murray, Lond. 1860). The soundness of the principles which the writings of B. uphold, notwithstanding the protectionist tendencies of the government, is now generally acknowledged in France.

BASTIDE, JULES, a French journalist and politician, minister of foreign affairs in 1848, and member of the constituent assembly, was born at Paris in 1800. In 1821, he became one of the first members of the French Carbonari; and after the July revolution, he was conspicuous among the writers of the radical opposition. On the reconstitution of the national guard, B. was elected commandant-in-chief of the legion of artillery, in which the republicans were grouped, and took part in the two insurrectionary movements, for the second of which—the *émeute* at Paris, 5th June, 1832—he was condemned to death, but escaped to London. Pardoned in 1834, he returned to Paris, and again devoted himself to politics in the columns of the *National*. B., however, being one of those Neo-catholic republicans who regarded the church of Rome as the religious synonym of democracy, could not heartily sympathize with the tone of that newspaper on religious topics, and in 1847 he founded the *Revue Nationale*, in which he advocated his peculiar opinions. During the revolution of 1848, he was a supporter of gen. Cavaignac, and an opponent of socialism. In 1858, he published *La République Française et l'Italie en* 1848; and in 1859 *Guerres de Religion en France*.

BASTILLE was, in France, a general term for a strong fortress, defended by towers or bastions (q.v.), and in this sense it was used in England also after the Norman conquest. The famous prison to which the name latterly was appropriated, was originally the castle of Paris, and was built by order of Charles V., between 1370 and 1383, by Hugo Aubriot, prévôt or provost of Paris, at the porte St. Antoine, as a defense against the English. Afterwards, when it came to be used as a state-prison, it was provided, during the 16th and 17th c., with vast bulwarks and ditches. On each of its longer sides the B. had four towers, of five stories each, over which there ran a gallery, which was armed with cannon. It was partly in these towers, and partly in cellars under the level of the ground, that the prisons were situated. The unfortunate inmates of these abodes were so effectually removed from the world without as often to be entirely forgotten, and in some cases it was found impossible to discover either their origin or the cause of their incarceration. The B. was capable of containing 70 to 80 prisoners, a number frequently reached during the reigns of Louis XIV. and Louis XV. Though small compared to the number which an ordinary prison contains, these numbers were considerable, when we reflect that they rarely consisted of persons of the lower ranks, or such as were guilty of actual crimes, but of those who were sacrificed to political despotism, court intrigue, ecclesiastical tyranny, or had fallen victims to family quarrels—and were lodged here in virtue of *lettres de cachet* (q.v.)—noblemen, authors, savans, priests, and publishers. On the 14th of July, 1789, the fortress was surrounded by an armed mob, which the reactionary policy of the court had driven into fury, and to the number of which every moment added. The garrison consisted of 82 old soldiers and 32 Swiss. The negotiations which were entered into with the governor led to no other result than the removal of the cannon pointed on the faubourg St. Antoine, which by no means contented the exasperated multitude. Some cut the chains of the first drawbridge, and a contest took place, in which one of the besieged and 150 of the people were killed, or severely wounded; but the arrival of a portion of the troops which had already joined the people with four field-pieces, turned the fortune of the conflict in favor of the besiegers. Delaunay, the governor—who had been prevented by one of his officers, when on the point of blowing the fortress into the air—permitted the second drawbridge to be lowered, and the people rushed in, killing Delaunay himself and several of his officers. The destruction of the B. commenced on the following day, amid the thunder of cannon, and the pealing of the Te Deum. This event, in itself apparently of no great moment, leading only to the release of three unknown prisoners—one of whom had been its tenant for thirty years—and four forgers, and in which it is said only the 654 persons whose names now appear on the column in the Place de la Bastille, took part, nevertheless finally broke the spirit of the court-party, and changed the current of events in France.

BASTINA'DO (from the Fr. *baston* or *bâton*, a cudgel), the name given by Europeans to the punishment in use over the whole east, which consists in blows with a stick, generally upon the soles of the feet, but sometimes upon the back.

BASTION, in fortification, is one of the principal defense-works in a fortified place. It is a kind of tower, very broad in relation to its height. The plain wall, called the *curtain*, which often surrounds a fortified town, is usually a polygon of many sides; and in that case, bastions occupy all, or nearly all, the salient angles. Bastions are mostly five-sided: the two outermost sides are the *faces*, meeting in an angle towards the enemy; the two on either side of these are the *flanks*, meeting two curtains or portions of wall; and the fifth side, open to the interior of the fortified place, is the *gorge*. Bastions may be regarded as projections, which enable the defenders to watch the approach of the enemy to the foot of the wall, and to frustrate them by a flanking fire. Taking the average range of modern ordnance and muskets as a basis, engineers decide on a distance of 300 to 400 yards between B. and B.; but if Armstrong or Napoleon guns, and Martini-Henry or Minié rifles, should hereafter be employed in attacking and defending fortified places, these figures will probably need modification. The length of each face and flank of a B. is so regulated, that two bastions can defend each other and the intermediate portion of wall. This principle was partly acted upon in the middle ages; but some of the Italian military engineers of the 16th c. first constructed the B. proper. The main substance of a B. is an immense mound of earth, capable of supporting heavy guns, and of receiving the fire of the enemy; but it is faced and strengthened in many parts with brick and stone. The top is broad enough to allow room for the large guns, and for infantry and artillery soldiers. A *hollow* B. has the space within it kept down to the level of the town or natural ground; but a *solid* B., filled up to the top with firm materials, is considered to be the best defensive construction. Vauban, the great French engineer, devised the plan of having large *detached* bastions opposite the chief angles of the place, with a ditch behind each: a tower or small B. being placed at the real angle of the wall behind. This was intended to enable the besieged to hold out for some time, even after the great bastions were taken.

The relation which bastions bear to the general system of attack and defense, is noticed under FORTIFICATION and SIEGE; while various details on the subject will be found under BATTERY, CASEMATE, CURTAIN, DITCH, EMBRASURE, ESCARP, PARAPET, RAMPART, etc. In woodcuts illustrating many of these articles, the relative position of the B. will be better shown than by any diagram in this place.

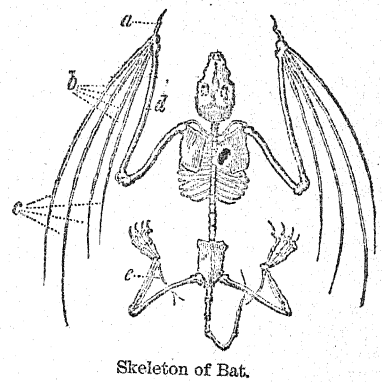
BASTROP, a co. in central Texas, intersected by the Colorado river and the Houston and Central Texas railroad; 880 sq.m.; pop. '70, 12,290—5233 colored; in '80, 17,135. The surface is undulating and fertile; corn and cotton are the principal crops. There is abundance of lignite coal. Co. seat, Bastrop.

BA'SYLE is the name given by chemists to a simple or compound substance which can unite with oxygen to produce a base (q.v.). Thus, all the metals are examples of simple basyles, and ammonium (NH_4), ethyle (C_2H_5), methyle (C_2H_3), etc., represent compound basyles. Another property which a B. possesses is, that it can unite with a salt radical (q.v.), like chlorine or cyanogen, to form salts. Thus, the B. sodium (Na) combines with chlorine to produce a salt—in fact, common salt (NaCl); and mercury (Hg) unites with cyanogen (Cy) to form the salt cyanide of mercury (HgCy).

BAT, the common name of all animals of the class *Mammalia* which are furnished with true wings, and so are capable of really flying or propelling themselves in the air. They were all included by Linnæus in the genus *vespertilio* (old Latin name), now subdivided and forming the family *vespertilionidæ*, which is very generally regarded as of precisely equal extent with the sub-order *cheiroptera* (Gr. hand-winged), although some naturalists still follow Cuvier in regarding the *galeopithecidæ* (colugos or flying lemurs) as another family of cheiroptera. But besides other characters which connect the colugos with lemurs rather than with bats, they greatly differ from bats in having a mere extension of the skin of the flanks attached to the limbs—as in the flying squirrels and petaurists or flying phalangers, and in the flying dragon among saurian reptiles—capable of sustaining them in the air like a parachute in a very extended leap, but not of being expanded and closed by a succession of strokes for true flight. The power of true flight, bats, on the contrary, possess; and some of them not only fly rapidly, but wheel about very nimbly in the air, in pursuit of their insect prey.

It is very interesting to compare the organs of flight in bats with those of birds, both as to the points in which they agree, and those in which they differ. They beat the air, as birds do, with their anterior members; but the requisite extension of surface is not obtained by quills, but by a great elongation of the arms and fingers, upon which a thin membrane is stretched, folding close to the body by means of their joints, when the wing is not in use. A little attention to the accompanying figures of the skeleton of a bat and of a bat flying, will make plainer than mere words can the relation of the bones of a bat's wing to the bones of the human arm and hand, or to the ordinary bones of the anterior extremities in quadrupeds which have fingers or toes. The thumb, *a* (in figure of skeleton), is short, armed with a strong nail, and not at all included in the wing-membrane, nor used in flight. The bones most elongated of all are the metacarpal bones, or bones of the hand, *b*; the true finger-bones, *c*, are not so much so. The fore-arm, *d*, has

not two bones (radius and ulna), but only one (the ulna), with a sort of rudiment of the other; the rotatory motion, of which these two bones afford the means, being not only unnecessary to bats, but at variance with the purpose chiefly designed in this part of their structure, of a powerful stroke in one particular direction. For a similar reason, "the fingers of this strange hand are incapable of closing towards the palm, as ours do, when grasping an object: their only movements are such as fold up the wing against the side of the body, by laying the fingers close along the side of the fore-arm, as in closing a fan." Great strength, however, was requisite in the shoulder; and, accordingly, we find an analogy to birds in the size and solidity of the bones in this part, as well as in the thickness of the muscles by which the wings are moved, and still more in the great dimensions of the sternum, or breast-bone, to which they are attached. The sternum is also furnished with a medial ridge, as in birds, for the better attachment of the muscles. The ribs are large; but the other bones generally, as those of the head and of the pelvis, are delicate, and appear designed for lightness.—The winged membrane of bats extends along the flanks to the hind-legs, although these aid little in flight; but it is attached to them so as to leave the feet free, which are much like the feet of ordinary small quadrupeds with toes and claws, and are employed along with the thumbs of the anterior limbs in creeping upon the ground, in climbing perpendicular rough surfaces, or for hanging with the head downward in that remarkable posture of repose in which bats pass great part of their lives, and in which they differ from all other animals.



Skeleton of Bat.

In the greater number of species of B., the wing-membrane extends not only to the hind-legs, but beyond them to the tail, which is included in it, a peculiar bone (*e* in fig. of skeleton) also arising from each heel to afford further support to this part of it, which seems to serve purposes analogous to the tail of birds, acting as a rudder, and enabling the animal to make those rapid evolutions in the air, which it is so pleasing to see as bats flit about in the summer evening. The fruit-eating bats of tropical regions, which have no need to perform such evolutions, are destitute of this interfemoral part of the membrane; and according to the habits for which each species has been designed, the tails are long or short, entirely included in the membrane, or only for part of their length, or produced a very little beyond it, and terminating in a hard tip, so that the tail is capable of being used to aid in creeping or climbing, evidently possessing considerable power, and being curved and moved in a manner which suggests a slight analogy to the prehensile tails of monkeys.

Bats were placed by Linnæus in his order *primates*, along with monkeys and lemurs, with which they agree in their pectoral teats and in other characters, particularly of the organs of reproduction. In one genus (*dysopus*), there is an additional resemblance to the primates in the partially opposable thumbs of the hind-feet, and a trace of this character is to be found in the fore-thumbs already noticed. Bats are now, however, generally placed by naturalists in the order *feræ* or *carnaria*, although, like many other animals of that great order, most of them are by no means exclusively carnivorous. The greater part of them feed chiefly on insects, some chiefly on fruits. They exhibit considerable variety both in the number and character of their teeth, as might be expected in animals which differ so much in their food. All of them have four rather large canine teeth; the incisors vary much in size and form, as well as in number. The digestive apparatus exhibits a variety corresponding with that of the teeth; the intestinal canal of the vampires (q.v.), which live by sucking the blood of animals, proceeding almost in a straight line from one extremity of the body to the other, whilst that of some of the frugivorous bats, as the kalong (q.v.) (*pteropus*) of Java, is seven times as long as the body.

Except in the power of flight and things essential to it, bats present no resemblance to birds. The old English name *flittermouse*, and the German *fledermaus*, indicate an early popular recognition of their true place in creation. They are generally nocturnal animals, or, at least, prefer the twilight, although one of the British species may occasionally be seen pursuing insects during winter at midday. They generally spend the day in caves, hollow trees, and other dark recesses, often under roofs of houses, and in crannies of ruined or deserted buildings. They are found in almost all parts of the world, except the very coldest, but are most numerous and of greatest size within the tropics. Those of temperate climates generally spend the winter in a state of torpidity, in which, although circulation continues very languidly, respiration does not ordinarily take place. The whole number known to Linnæus amounted to a very few species, not half so many as are now known to inhabit Great Britain alone. Upwards of 130 species have been described, and there is great probability that the actual number existing is

very much greater. It is not unlikely that some exaggerated accounts of the great bats of warm climates gave rise to the fable of the Harpies, which Virgil introduced into the *Æneid*. The bats of Europe are all small; the body of the largest British one is not so large as a mouse, and the fullest stretch of its wings about 15 in., whilst the common British species are much smaller; but in the kalong, already mentioned, the stretch of wing is 5 feet. Of British species, the largest is the noctule B. (*vespertilio noctula*), a very local species, found chiefly in the s. of England; the pipistrelle B. (*V. pipistrellus*) is perhaps the most common. It was long confounded by British naturalists with the common B. of the continent of Europe (*V. murinus*), which is much larger and very rare in Britain. In some parts of the country, the long-eared B. (*plecotus auritus*) is very common. It is distinguished by its enormously large and very beautiful ears, which, when it is asleep, are folded up in a remarkable manner under the arm, the long *tragus* then resembling a slender ear. This great development of the ears is characteristic of certain genera of B., that part of the ear called the *tragus* attaining also a remarkable size, so that it seems like a smaller ear in front of each large one. In many species, only two of which are found in Britain, there is a still more remarkable membranous or leaf-like appendage on the nose, which in some is simple, in some complex, and often of large size, giving an extraordinary appearance to the face. Some of the larger species, having a nasal crest, are called specter bats (q.v.). Only two species of B. (*rhinolophus*), possessing such an appendage, are found in Britain, both of them very rare; from the form which it assumes, they are called horseshoe bats. It is supposed that this nasal appendage is of use as a very delicate organ of touch, perhaps also of smell; as the great ears may be of use both for touch and hearing. These senses must often guide bats when that of sight cannot be employed; and the sense of touch appears to be possessed in no ordinary degree even by the winged membrane. By supposing it to be affected by the pulsations of the air, Cuvier accounted for the power displayed by bats which had been cruelly deprived of sight, of avoiding objects amongst which they flew, without the necessity of ascribing to them, as Spallanzani had done, the possession of a sixth sense.

It deserves to be here noticed that amongst the peculiarities which distinguish certain genera of bats, is the absence not only of the upper cutting teeth in the East Indian and African genius *megaderma*, but even of the bone in which these teeth are usually placed; and that another tropical genius, *nycteris*, of which the species are found in Africa and Java, have the skin attached to the body only at a few points, and capable of being blown up like a bladder, at the pleasure of the animal, by means of air, which is inhaled through the nostrils into cheek-pouches communicating by small apertures with the general skin-bag. The use of this is wholly unknown.

Bats walk or creep awkwardly upon the ground, one side of the body being jerked forward, and then the other, yet they run with considerable celerity. There is a common notion that they cannot rise easily from a level surface, but must find some eminence from which to throw themselves. Of the fallacy of this, any one will soon be convinced who gets a B. and places it upon the floor.—Bats commonly produce one or two young at a birth.—Some of the species are very gregarious; others often fly about in pairs; great numbers, and of different species, are often found congregated in their places of hybernation or repose.—Some of the species are easily tamed, and become very familiar; but their odor is disagreeable, and it is generally found difficult to keep them long alive.

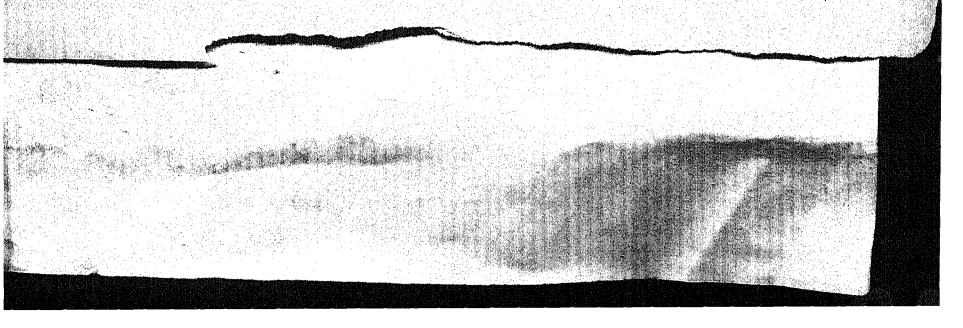
Fossil remains of *cheiroptera* are occasionally found in eocene rocks, but owing to the delicacy of the bones, great difficulty has been experienced in the determination of the genera and species.

BAT, or BÂT (Fr.) in military matters, was originally the name of a kind of pack-saddle; and hence a bat-horse was a baggage-horse bearing a bat or pack, and a bat-man was a servant in charge of the horse and bat. By a modification of meaning, a bat-man is now any soldier allowed to act as servant to an officer. When British troops are sent on foreign service, bat-horses or mules are provided (if carriages are not forthcoming) for carrying the regimental books, the kettles, and tents, the medicine-chest, the veterinary medicine-chest, intrenching tools, armorers' stores, saddlers' stores, etc.—about 20 such horses or mules to each battalion. Bat-horses and bat-men are also provided for carrying officers' camp-equipage. An allowance for procuring these accommodations is usually called bat-money.

BATAK. See BATTAS, *ante*.

BATAN'GAS, a seaport t. of the Philippines, island of Luzon, and capital of the province of the same name. Lat. 13° 45′ n., long. 121° 5′ east. Distance from Manilla, 50 m. s.; founded 1581. Pop. of town and district, 17,000. B., which is well built, and has an elegant appearance, is finely situated on an extensive bay which opens into the strait of Mindoro. Considerable advantage is taken of its facilities for commerce.

BATARDEAU', a strong wall of masonry, built across the outer ditch of a fortress, to sustain the pressure of water when one part of the ditch is dry and the rest wet. It is built up to an angle at the top, and is armed with spikes, to prevent the enemy from crossing; and sometimes a stone tower is provided to strengthen the defense. There is a sluice-gate to regulate the admission of water.



BATA'TAS, or SWEET POTATO (*Convolvulus batatas*, or *batatas edulis*, the genus *batatas* having recently been separated from *convolvulus* (q.v.), chiefly upon account of the four-celled ovary), a perennial plant with long creeping stems, heart-shaped leaves on long stalks, and variously lobed, large purple flowers much resembling those of the best known species of convolvulus, and very large oblong acuminated tubers. It is a native of the East Indies, but is now cultivated in all tropical and sub-tropical countries for its tubers, which are highly esteemed as an article of food, and are eaten either roasted or boiled; they are sweet, wholesome, and nutritious, but somewhat laxative. The B. forms, next to maize, the principal food of the poorer classes in some parts of America. Its cultivation is very easy; it is readily propagated by tubers or by cuttings of the stem, requires little attention, and soon produces its tubers. In hot-houses in Britain, these are without difficulty obtained at 1 lb. or 2 lbs. weight. The cultivation of the B. has been introduced into the s. of Europe. In America, it is little cultivated to the n. of New Jersey, and even there is inferior. The leaves are used as a boiled vegetable. It is the B., or sweet potato, which is usually meant by the older English writers, when they mention potatoes. Its tubers were imported into England by way of Spain, and sold as a delicacy, before the potato was known—*batatas paniculata*, or *convolvulus paniculatus*, a nearly allied species, is cultivated in the same way as the common B., and its tubers are similar in quality.—To the new genus *batatas*, has been referred also the plant formerly known as *ipomœa macrorhiza*, now *batatas jalapa*, so called from supposed purgative qualities of the root, which, however, it is found not to possess, being white, insipid, saccharine, and farinaceous, and of great size, 50 to 60 lbs. in weight. The plant inhabits sandy soils in Georgia and Carolina.

BATA'VI (or, according to some MSS., VATAVI), the name of a German people, who anciently inhabited a part of the present Holland, particularly the island which was called after them, Batavia, formed by the branch of the Rhine which falls into the sea at Leyden, the Waal, and the Meuse. Their country, however, extended across the Waal, but its boundaries cannot now be precisely determined. According to Tacitus they were originally a branch of the Chatti, who emigrated across the Rhine. They were conquered by Germanicus; became subject to the Romans, and served them so well, that they obtained the honorary title of friends and brothers of the Roman people; were exempted from taxes and assessments, being only required to provide a proportion of troops; and were permitted to choose their commanders from amongst themselves. Their cavalry were particularly good, and were often employed by the Romans. The first who terms the insular district inhabited by these Gauls, Batavia, is Zosimus, who also informs us that in the time of Constantius (358 A.D.) it had fallen into the hands of the Salii, a Frankish tribe.

BATA'VIA, properly the name of the island occupied by the ancient Batavi, became at a later date the Latin name for Holland and the whole kingdom of the Netherlands. The name BATAVIAN REPUBLIC was given to the Netherlands on their new organization of 16th May, 1795, and they continued to bear it till they were converted into the kingdom of Holland, under Louis Bonaparte, 5th June, 1806.

BATA'VIA, the capital of the empire of the Netherlands in the East Indies, stands on the n.w. coast of Java, at the mouth of the Tjiliwong, frequently called the Jaccatra, from the former native town, on the ruins of which the present city was built. There is good anchorage for large ships in the offing, and it is navigable for smaller vessels towards the interior. The influence of a vertical sun on this Holland in miniature led it to become proverbial as the grave of Europeans. Latterly, however, the climate has been greatly improved by draining. The temperature, though not extreme, is oppressive from its uniformity, the mean of winter being 78.1° F., and that of summer only 78.6°. The lat. is 6° 7′ 40″ s., and the long. 106° 52′ east. Pop. 65,000. Notwithstanding the growing prosperity of Singapore, B. continues to be the commercial emporium of the far east. Its markets present at once all the productions of Asia, and all the manufactures of Europe. In 1811, while Holland was under France, B. was taken by the English, but was restored to its former owners in 1816. Latterly, B. has found Singapore a formidable competitor for the trade between east and west. The Dutch government has laid a telegraphic cable of 600 m. from B. to Singapore. There is a railway from B. to Buitenzorg, 36 miles.

The province of B. is low, but rises gently towards the south. The forests have all been cut down for the use of the sugar factories. It is well adapted for fruit-trees and vegetables, which are cultivated by Chinese gardeners. B., including Buitenzorg, had a pop. (1st Jan., 1874) of 983,868, consisting of 6081 Europeans, 69,397 Chinese, 907,426 natives, and 964 other orientals. The peculiar character of the people has been lost by the influx of and intermarriage with strangers from all districts of the Indian archipelago. The language is a mixture of Sundanese, Malay, and other tongues, and is called low Malay. The largest estates are held by Europeans, the smaller by Chinese and natives. The religion is chiefly Mohammedan. There are good post-roads and some canals. The industries continue to increase, and chiefly consist of factories for making machinery for distilling and for sugar works; distilling arrack, copper and tin work, dyeing, etc. The nutmeg, cacao, and cocoanut tree are successfully grown. The stock consists of buffaloes, horses, and cattle.

BATA'VIA, a village and township in Kane co., Ill., 39 m. w. of Chicago, with which it is connected by the Chicago, Burlington and Quincy, and the Chicago and Northwestern railroads; pop. '70, 3018. It has a private insane asylum, manufactories, and valuable quarries.

BATA'VIA, a village and seat of justice of Genesee co., N. Y., 36 m. e. of Buffalo; with railroad connections to all points; pop. of village and township '75, 7067. It has the state institution for the blind, a ladies' seminary, a library, and several manufactories.

BATCHIAN, or BATJAN. See BATSHIAN, *ante*.

BATEMAN, KATE JOSEPHINE, an American actress, b. Maryland, 1843. With her sister Ellen she appeared on the stage almost in infancy, and exhibited unusual talent. In 1861, she began her adult career in New York in *Julia*, *Pauline*, *Juliet*, etc., and in the next year made a remarkable success in *Leah*. She played in several American cities and then in England, having the management of a theater in London, and accumulating fame and fortune. In 1866, she became the wife of George Crowe, an English physician.

BA'TENBURG, a t. of the Netherlands, in the province of Gelderland, situated on the right bank of the Maas, 9 m. w. of Nymegen. It is worthy of notice only on account of its association with the Romans, whose *oppidum batavorum* it was.

BATES, a co. in w. Missouri, on the Kansas border; traversed by the Missouri, Kansas, and Texas railroad, and intersected by Osage river; 900 sq.m.; pop. '70, 15,960 —320 colored; in '80, 25,080. It is a prairie region, producing grain, tobacco, and cattle. There are beds of coal and carboniferous limestone, and plenty of timber. Co. seat, Butler.

BATES, BARNABAS, 1785–1853; b. England; advocate of cheap postage in the United States; Baptist minister in Rhode Island; established the *Christian Inquirer* in New York, and while assistant in the post-office there, he became interested in the reduction of postage. After many years of writing and speaking, his object was achieved in respect to land postage.

BATES, EDWARD, LL.D., 1793–1869; b. Virginia; an early settler and lawyer in Missouri, member of the legislature, of the constitutional convention, and representative in congress. He was an unsuccessful candidate for president in the convention that nominated Lincoln in 1860, and was attorney-gen. in Lincoln's first cabinet.

BATES, JOSHUA, 1788–1864; an English banker, b. in Massachusetts. He established a house in London in connection with John Baring, son of sir Thomas Baring, and subsequently went into the firm of Baring Brothers. He gave $50,000 towards founding the Boston public library. His only child is Madame Van de Weyer, the wife of a Belgian diplomatist.

BATES, WILLIAM, D.D., 1625–99; an English non-conformist divine, one of the commissioners for reviewing the public liturgy, and one of those concerned in drawing up the exceptions to the book of common prayer. He was appointed chaplain to Charles II., and became minister of St. Dustan's, but was deprived of his benefice for non-conformity. He published in Latin, *Select Lives of Illustrious and Pious Persons;* other works appeared after his death.

BATH, the chief city in Somersetshire, England, is beautifully situated in a wooded valley in the n.e. part of the co., on the Avon, 20 m. from its mouth, and 106 m. s.w. of London. The houses are built wholly of white freestone—"bathoolite," worked in the neighboring quarries—bricks being entirely discarded. The city has a finer appearance than any other in England, the variety of level giving very commanding sites for its fine and regular streets, crescents, and public buildings. The beauty and sheltered character of its situation, the mildness of its climate, and especially the curative efficacy of its hot chalybeate springs, have long rendered B. a favorite fashionable resort. The springs, which are four in number, were known to the Romans, who built baths on the spot in the 1st c., of which extensive remains were discovered in 1775. The temperature of the springs varies from 97° to 117° F.; they rise near the river bank, in the center of the city, and discharge 184,320 gallons of water daily. The water is most useful in bilious, nervous, and scrofulous complaints, palsy, rheumatism, gout, and cutaneous diseases. Though the gayety of B. has greatly waned since the days of the prince regent, there has been a great general improvement in the city, but the pop somewhat diminished during the twenty years 1851–71. It has two parks, and many public walks and open places; theater, concert-rooms, and other places of amusement; subscription library, museum, club-house, educational institutions, etc. The abbey church is a cruciform structure in the latest perpendicular style, with a fine roof in the style of Henry VII.'s chapel, and a central tower 150 ft. high. About a mile to the n.w. is Beckford's tower, built by the eccentric author of *Vathek*, but now a cemetery chapel. It is 154 ft. high. B. returns two members to parliament. Pop. '71, 53,704, at times much increased by visitors. B. has no manufactures of any note. Coal is found in the neighborhood. The Great Western railway from London to the w. passes through the city. B. is of great antiquity; it was a Roman station called *Aquæ Solis*, at the inter-

section of the great Roman ways from London to Wales, and from Lincoln to the s. coast of England. Richard I. granted B. its earliest extant charter, which was subsequently confirmed by Henry III. and greatly extended by George III. A greater number of Roman remains have been found in and near B. than elsewhere in Britain; they form a collection unrivaled in extent and value.

BATH, KNIGHTS OF THE. The name of this order is derived from the ceremony of bathing, which used to be practiced at the inauguration of a knight, as an emblem of the purity henceforth required of him by the laws of chivalry. The ceremony is of unknown antiquity, and is spoken of by writers of the 13th c. as an ancient custom. See KNIGHT. The earliest authentic instance of its observance which we have in this country, is in the time of Henry IV., who, in preparing for his coronation, made forty-six knights at the tower of London, who had watched all the night before, and bathed themselves. The last knights of the B. created in the ancient form were at the coronation of Charles II. in 1661. From that period till the accession of the house of Hanover, the order fell into oblivion. It was revived by George I. in 1725, and is now the second order in rank in England, the first being the Garter. By the statutes then framed for the government of the order, it was declared that, besides the sovereign, a prince of the blood, and a great master, there should be thirty-five knights. At the conclusion of the great war, it was thought expedient, with a view to rewarding the merits of many distinguished officers, both military and naval, to extend the limits of the order, which was effected on the 2d Jan., 1815. But the order was still purely military, and it was not till 1847 that it was placed on its present footing by the admission of civil knights, commanders, and companions. The following is its present organization.

First Class.—Knights grand cross (K.G.C.); the number not to exceed, for the military service, 50, exclusive of the royal family and foreigners; and for the civil service, 25.

Second Class.—Knights commanders (K.C.B.); military, 102, and civil, 50, exclusive of foreigners. These, like the first, have the title *sir*, and take precedence of knights bachelors.

Third Class.—Companions (C.B.); military, 525, and civil, 200. They take precedence of esquires, but are not entitled to the distinctive appellation of knighthood. No officer can be nominated to the military division of this class unless his name has been mentioned in the *London Gazette* for distinguished services in action; and the order has never been conferred on an officer below the rank of a major, or commander in the navy.

BATH, a co. in n.e. Kentucky, on the Licking river; 220 sq.m.; pop. '80, 1,982—2,014 colored. It has abundance of iron and coal, and several medicinal springs, and produces cereals and wool. Co. seat, Owingsville.

BATH, a co. in Virginia in the Alleghanies, on the West Virginia border; 725 sq.m.; pop. '70, 3795—889 colored. Its surface is hilly, with fertile valleys, producing wheat, corn, oats, and cattle, and there are medicinal springs of value. Co. seat, Warm Springs.

BATH, a city and port of entry in Maine, on the Kennebec, 4 m. below the junction with the Androscoggin, 12 m. from the sea and 35 m. s. of Augusta; the seat of justice of Sagadahoc co.; pop. '70, 7371. Ship-building is the main business, in which it ranks next after Baltimore. The harbor is never frozen, and being easily accessible it renders B. an important commercial place. It was incorporated as a town in 1780, and as a city in 1850. There is ample railroad connection in all directions.

BATH, a village in Steuben co., N. Y., 74 m. s.s.e. of Rochester on Conhocton creek; pop. of township, '75, 6704; in '80, 6779. It is the co. seat, and has an orphan asylum, court-house, and the New York state soldiers' home.

BATH, EARL OF. See PULTENEY, WILLIAM.

BATH—BATHING. By bathing is usually understood the immersion of the body, or a part of it, in water. In a more extended signification, it means the surrounding of the body with any medium differing in nature or temperture from its usual medium; thus, we speak of a blood-bath, a vapor-bath, a cold-air bath, a compressed-air bath (q.v.), an earth-bath. A fourfold division may be made of baths: 1. According to the substance with which the body is surrounded—into water, oil, milk, gas, sand, and other baths; 2. According to the manner of application—into river, slipper, plunge, shower, dropping, vapor, and douche baths; 3. According to the parts of the body subjected to the application—into whole, half, sitz, foot, hand, and eye baths; and 4. According to the temperature of the substance applied—into cold, tepid, warm, and hot baths.

The practice of bathing undoubtedly reaches back to the earliest times in the existence of the human race, and the most ancient historical accounts as well as popular myths make mention of it. Among the Egyptians, the bath was practiced as a religious rite; and, in general, we find the opinion prevailing throughout antiquity, that purification of the body induced or signified moral purity. Man, it was thought, ought to present himself pure in body and soul, when he engaged in the service of his god, or in any transaction that brought him into immediate contact with that being. In making the bath a religious ordinance, Moses may have had in view the prevention or more

speedy cure of those skin-diseases so prevalent in the east. The Mosaic law prescribes expressly, in some cases, the use of running water, which has given rise, through a misunderstanding, to the deleterious cellar-baths of the Jews. In Palestine, the wealthier Jews had private baths in their houses, and ponds in their gardens, an arrangement which prevailed in all the civilized parts of the east, and which does so still. There were, besides, public bath-houses among the Jews, as among other nations. Among the Greeks, also, bathing was very early in use. The practice is often alluded to in Homer. Bathing among the Greeks, as among other nations, was counted a religious rite, and was connected with the preparations for sacrifice, for the reception of oracles, for marriage, etc. We possess, however, no detailed accounts of the construction and arrangements either of private or of public baths in Greece, which last were mostly connected with the gymnasia. The men bathed together; that there were public baths for women, appears probable from various indications.

Among the Romans, although warm-baths (*thermæ*) were in use from the earliest times, yet it was only at a late period that they were so extensively adopted; and then the increased and universal spread of luxury had driven the primitive object of bathing into the background, so that the public baths were looked upon as places of general resort for pleasure. The most of these public baths were built under the emperors. They were numerous in Rome and in the provincial cities. Their construction may be gathered from their numerous remains, and from the description of them given by Roman writers; they resembled the Turkish and Russian baths.

The essential parts of a Roman bath were as follows: 1. The *hypocaust*, or stove, in the basement-story, for heating both the bath-rooms and the water. The water was contained in three receptacles or boilers, so arranged that the undermost, immediately over the fire, contained the hot water; the one in the middle, the tepid water; and the uppermost, the cold water. These vessels were so connected by pipes, both with the bath-rooms and with one another, that the hot water that flowed from the lowest boiler was replaced by tepid water from the one above; and that, again, by cold from the uppermost.—2. The *apodyterium*, or room for undressing.—3. The *frigidarium*, a room with a basin for cold bathing.—4. The *tepidarium*, the purpose of which cannot be exactly determined, but which seems to have been intended for bathing in tepid water, and also for allowing the body to cool down in a mild temperature.—5. The *caldarium*, in which sometimes the *sudatio*, or sweating-bath, and sometimes the real hot-water bath, were taken. This room had hollow walls, and the floor rested on low pillars over the hypocaust, so that it was surrounded on all sides with heated air. The *laconicum*, which is spoken of as a part of the caldarium, was probably a kind of stove that was heated from the hypocaust, and contributed to raise the temperature. In the bath-rooms there were basins (*alvei*) for holding the water, and round the walls were benches or seats, which, in the caldarium, were raised as in an amphitheater, in order to give the bathers the choice of the higher temperature of the upper part of the room, or of the more moderate of the lower. The caldarium contained also a *labrum* or vase of several feet diameter, filled with cold water, into which the bathers dipped after the hot bath. With these essential parts of a bath, there were usually connected an *unctuarium* or *elæothesium*—i.e., an anointing-room, and often gardens, covered walks, rooms for games, etc.

The processs of bathing was this: After undressing in the apodyterium, the bather was anointed in the elæothesium with a cheap coarse oil, and then proceeded to a spacious apartment devoted to exercises of various kinds, among which games at ball held a prominent place (hence the hall was called *sphæristerium*). After exercise, he went into the caldarium, either merely to sweat or to take the hot bath; and during this part of the process, the body was scraped with instruments called *strigiles*. Being now dried with cloths, and slightly anointed all over with perfumed oils, he resumed his dress, and then passed a short time successively in the tepidarium and the frigidarium, which softened the transition from the great heat of the caldarium into the open air.

The public baths for women were of similar construction, and were much frequented even by the most respectable. The women bathed in company, like the men. The irregularity of men and women bathing together is also alluded to by ancient writers; and in later times, the baths in general became the scenes of all sorts of debauchery, as was the case at Baiæ.

The most remarkable remains of Roman baths are those of the baths of Titus, of Caracalla, and of Diocletian in Rome, and the recently excavated thermæ at Pompeii: remains of the kind are also to be found in Germany, France, and England. The extent and magnificence of those edifices it is difficult for us now to conceive. Speaking of the baths of Caracalla, Mr. Fergusson, in his *Hand-book of Architecture*, says: "St. George's hall, at Liverpool, is the most exact copy, in modern times, of a part of these baths. The hall itself is a reproduction, both in scale and design, of the central hall of Caracalla's baths, but improved in detail and design, having five bays instead of only three. With the two courts at each end, it makes up a suite of apartments very similar to those found in the Roman examples. The whole building, however, is less than one fourth of the size of the central mass of a Roman bath, and therefore gives but little idea of the magnificence of the whole."

The ancient Germans seem, according to Tacitus and other writers, to have been

fondest of the cold river-bath. When Roman luxury was driven out by German-habits, and the n. of Europe got the upper-hand of the s., baths ceased to be of public importance, and amid the tempestuous irruptions and fluctuations of the different nations, those splendid edifices fell into ruins. Christianity, however, by the institution of baptism, had preserved for the bath its religious signification; and in the middle ages, among the ceremonies preceding the solemnity of conferring the honor of knighthood, the bath was held essential. The Arabians and the Mohammedans generally had more completely adopted bathing into their manners and customs. Islam enjoins on the believer the careful preservation of corporal purity; and for this purpose, prescribes repeated daily ablutions. Besides these, certain circumstances and times make the use of the B. ritually obligatory on both men and women. For this end, not only did the rich erect splendid baths in their houses and gardens, but bath-houses for the people in general were established in every town in which there was a mosque. The public baths of the Turks of the present day are a copy of those ancient Arabian baths. The construction of those oriental baths, imitations of which are now to be found in some European cities, is as follows: The building is of stone, the bath-rooms have a floor of marble, which is heated from below, and tubes in the walls conduct the heat in all directions. The bather undresses, wraps himself in a blanket, puts on wooden slippers, to protect him from the heat of the floor, and enters the bath-room. Here a general perspiration soon breaks through the skin, which is washed off with cold water. The body is then rubbed with woolen cloths, and smeared with a soap or salve beneficial to the skin. This is generally accompanied by the operation of "kneading." The bath-attendant stretches the bather on a table, pours warm water over him, and then begins to press, squeeze, and twist his whole body with wonderful dexterity. Every limb is straightened and stretched, and when he has finished one side, he begins on the other. He kneels upon the bather; he seizes him by the shoulders, makes his backbone crack, and every vertebra quiver, or applies soft blows to the fleshy parts. He then takes a hair-cloth, and rubs the whole body, rubs off the hard skin of the feet with pumice-stone, anoints the bather with soap and perfumes, and finishes by cutting his hair and beard. This treatment lasts some three quarters of an hour; and the feeling after it is as of being born anew. An inexpressibly delicious sensation of comfort pervades the body, and soon ends in a sweet sleep. After bathing, people repose in a cooler room, stretched on couches, and finally partake of coffee, sherbet, or lemonade.

In England, France, and Germany, public establishments for bathing were long unknown. It was during the crusades, which brought the east and west into contact, that Europeans first became acquainted with the baths of the Asiatics; and the want of such institutions came to be more sensibly felt from the leprosy and other skin-diseases which intercourse with Asia introduced into western Europe. The evil was at first sought to be met by establishing hospitals; but as these were found insufficient, baths and bath-rooms were erected, which gradually became public establishments.

Besides the kinds of baths already described, there are now to be found in the larger cities of Europe, generally in connection with water-baths, imitations of the vapor-baths which have been long in common use in Russia. The Russian bath consists of a small apartment built of wood, with broad benches running round it, on which the people lie undressed. By throwing water upon glowing hot pebbles, a dense hot steam is produced, which envelops the bathers, and throws them into such a heat, that the perspiration breaks out over the whole body. In this atmosphere of steam, the thermometer often rises to 112°–140° F. After they have sweated for some time, and from time to time cooled themselves again, by having cold water poured over them, the skin is rubbed with soap, and with towels made of inner bark, or with brushes; they are flogged with softened birch-twigs, and then washed with tepid, and afterwards with cold water; and at last have cold water dashed over them. A bather will also go direct from the sweating-bath, and plunge into a river or a pond, or roll himself in the snow. These baths are a necessary of life in Russia, and are to be found in every village. The German vapor-bath differs in this, that the steam is produced in a boiler, and that the bather remains for some time in an adjoining room of moderate temperature, wrapped in blankets, to allow the perspiration to go on, and the blood to become calm. A ruder kind of sweating-bath, in a hole in the earth, or in a baking-oven, is practiced among many nations; among the Finns, the natives of Mexico and South America, etc.

As regards detergence, the vapor-bath is the only kind of bath that is really effectual. Seated naked in a room filled with hot vapor (which produces no inconvenience in breathing), the scurf, which, notwithstanding all sorts of previous ablutions, has accumulated on the skin, is gradually softened and loosened, and is rubbed off in a surprising manner by the hands of the bath-man who is in attendance at these establishments. As in the Turkish bath, the person is cooled down by being dashed with tepid and cold water. After this kind of bathing, the sensation is exceedingly agreeable. The process just mentioned may be said to resemble that in use by the Romans; the hands of the operator having much the same effect as the *strigiles* of the ancients. Few of the ordinary bathing establishments in Great Britain have vapor-baths, at least not on a proper footing; and the great value of this species of bath as a purifier of the skin is little known.

Bathing is a very important agent in the preservation and restoration of health. Besides promoting cleanliness, the refreshing and invigorating effects of cold bathing in

its various forms have always been more or less understood, as have also the soothing effects of the warm bath. But the virtues of water as a curative agent have been more fully developed in modern times, since the rise of the system of therapeutics known as the water-cure or hydropathy. With that exaggeration which is incident to everything new, the first promoters of this system gave it out as a panacea "for all the ills that flesh is heir to." But now that these quackish pretensions are all but universally given up, it is very generally admitted that water is capable of a large range of effects, some of them apparently of the most opposite kinds; while the mode of action is nothing mysterious, but capable of explanation on the recognized principles of physiology. The fuller exposition of this part of the subject will be more conveniently considered under HYDROPATHY.

A MEDICATED BATH is one in which some substance, intended to act as a medicine, has been mixed with the liquid. This is one of the most important methods known to medical art of bringing remedies to bear upon the system. The skin is by no means impervious to foreign substances; and no other organ presents at once so large a surface to the matter to be imbibed; at times, also, the other channels by which remedies are introduced into the body cannot be used. Baths of this kind are partly imitations of natural mineral waters, and partly other remedial mixtures. The mineral substances used are common salt, chloride of lime, nitric acid, corrosive sublimate, potash or soda caustic or carbonated, ashes, soap, iodine, sulphur, iron, etc.; the vegetable are wine, vinegar, solutions of essential-oils, infusions of thyme, rosemary, lavender, wormwood, willow, oak, and Peruvian bark, etc.; such animal substances as milk, blood, bouillon of meat, etc., are also sometimes employed as baths, with a view to impart nourishment, but whether much is taken up into the system, is doubtful. In the case, also, of vapor-baths, medicaments are added to the water with good effect; these must, of course, be volatile. If the whole body is to be immersed in the vapor, nothing must be used that might injure the organs of respiration; when the application is partial, and by a special apparatus, this precaution is less necessary. In connection with this may be mentioned the so-called SMOKE-BATHS, or medicated fumigations, in which the whole body, with exception, of course, of the head, or particular parts of it, are brought in contact with the vapors of dry medicinal substances. Resinous aromatic substances, incense, myrrh, benzoin, amber, sulphur, cinnabar, and mercury are used for this purpose. The application must be made in what is called a fumigating-box, in which the particular part of the body alone is inclosed along with the vapor, in order that the respiratory organs may not be incommoded. The utmost precaution is requisite with the vapors of sulphur and mercury, as they are apt to occasion serious accidents.

Another species of vapor-bath is what is called an ANIMAL BATH, which was known to the ancients, and was in great reputation in cases of lameness. Either the whole body of the patient is wrapped in the skin of a newly slaughtered animal, or an opening is made, and the diseased limb inserted into the breast or belly of the animal while yet alive, or into the newly drawn blood. Sometimes smaller animals are killed, split up, and immediately applied to the diseased part.

Of GAS BATHS, the most generally used are those of sulphuretted hydrogen and carbonic-acid gas, which are to be had at certain mineral springs. The first, mixed in small quantity with atmospheric air, lowers the irritability of the air-tubes, and affords relief in many diseases of the respiratory organs. A stronger mixture of it, brought in contact with the outer surface, is of use in disorders arising from depression of the functions of the skin. Carbonic-acid gas gives a gentle stimulus to the skin, promotes menstruation, and is much used in many places in the form of half-baths. In recent times, at Ischl and other places, the vapors that arise from the mineral springs loaded with saline particles, are received in close rooms, in which the patients walk about, and allow the vapors to act upon the lungs and skin.

The terms *water-bath* and *sand-bath* have been adopted in chemistry, to signify a contrivance by which vessels that are to be heated to a certain temperature are not brought into immediate contact with the fire, but receive their heat through the medium of hot sand or water, so that the heating takes place uniformly, and overheating is avoided

BATHGATE, a t. in the center of Linlithgowshire, 17 m. w.s.w. of Edinburgh. The old town lies on a steep slope, and the new on a more level site. Freestone, coal, and carboniferous limestone, are wrought in the vicinity. In 1663, king Charles II. granted B. a charter, since which time it has been a free burgh or barony. In the vicinity is the site of an ancient castle, which Margaret, daughter of Robert the Bruce, brought as a part of her dowry to her husband, Walter, great steward of Scotland, who died here. The celebrated gas coal called Torbanehill mineral, which has been the subject of so much litigation, and of discussion and difference of opinion among scientific men, is worked here. B. has manufactures of cotton goods, but mining is the chief occupation of the inhabitants. Pop. '71, 6942.

BATHOMETER, an instrument invented by C. William Siemens, for indicating the depth of the sea beneath a passing vessel. The density of sea-water is about 1.026, while that of solid earth or rock has an average of about 2.75. Hence, the attraction emanating from the water which lies beneath the ship, is less than that which would be exerted

by earth or rock occupying the same relative position, and the greater the depth of the water, the greater the loss of attraction. Hence, further, the weight of a given mass of matter on board the ship will be greater when the ship is ashore than when afloat, by an amount which may be made appreciable by an instrument of sufficient delicacy, and this diminution of weight may become a recognizable function of the greater depth of water. Dr. Siemens fills with mercury a vertical steel tube of small bore, fitted below with a cup-shaped expansion closed with a corrugated steel-plate diaphragm. The pressure of the mercury upon the upper surface of the diaphragm is antagonized by a plate adjusted to bear upon the center of its under surface, and this plate is supported by steel spiral springs that are attached to the top of the column. In the construction of the instrument, care has been taken to compensate for the variations caused in the density of the mercury, and in the elasticity of the steel springs, by change of temperature. As the tension of the springs varies with their extension, while the pressure of the mercury on the diaphragm varies with the attraction from deep or shallow water, the two forces adjust themselves by a movement of parts, and the motion is so magnified by a micrometer screw, having an electric tell-tale, that the apparatus indicates a change of a fathom in depth of water for each division on the scale of the micrometer.

BA'THORI, ELIZABETH, the niece of Stephen Bathori, king of Poland, and wife of count Nadasdi, a Hungarian nobleman, was born in the latter half of the 16th century. Her diabolical cruelty has condemned her memory to eternal infamy. By means of large bribes, she induced an old man-servant and two female servants to kidnap and convey to her, either by stratagem or force, young girls from the neighboring country, whom she slowly put to death in the dungeons of her castle by the most horrible tortures. It is related that on a certain occasion, having violently struck one of her victims, the blood spirted up into her own face, and, as she fancied, left the skin whiter when it was wiped off. An infernal idea instantly possessed her. She invited to a grand banquet all the young girls round about, and caused 300 of them to be put to death, being under the impression that a bath of blood would renew her youth. So monstrous a story is probably exaggerated, but it at least shows that she was conceived capable of it. Inquiry was at length made into the appalling rumors, when it was discovered that this female fiend had murdered, in cold blood, not fewer than 650 maidens. The domestics who assisted her were either beheaded or burned alive; but the countess, whose crimes merited infinitely the greater punishment, was merely imprisoned for life in her fortress of Esej, where she died in 1614.

BATHOS (Gr. *bathos*, depth) is a term employed by critics to designate a ludicrous descent from a lofty thought to a mean one, or a sinking below the ordinary level of thought in a ridiculous effort to aspire. See CLIMAX. It is of the essence of B. that he who is guilty of it should be unconscious of his fall, and while groveling on the earth, should imagine that he is still cleaving the heavens. A good example of B. is the well-known couplet:

And thou, Dalhousie, the great god of war,
Lieutenant-general to the earl of Mar.

BATHS AND WASH-HOUSES, PUBLIC. The last few years have witnessed the erection of a number of public establishments, at which the masses may enjoy a bath for the merest trifle of their weekly earnings. Where steam-engines are employed in connection with cotton-factories or other works, there is usually a certain quantity of waste steam or waste hot water at disposal, which could, at an insignificant cost, be directed into baths for the use of the workmen of the establishment. We are aware of one instance where seven baths were comfortably fitted up at the small expense of £80, in which the men and women bathe on alternate days, to the number of from 30 to 80 a week—paying a mere trifle to the keeper, who attends an hour and a half each evening, and finds towels, soap, etc., nothing being charged by the proprietors for the original outlay. But this is only a small part of the cure for a great evil. Where the masses are densely packed in lanes and alleys, where house-accommodation is dear and limited, where the necessaries of life have to be continually struggled for, and these conventional evils increased, in too many instances, by improvidence—the house is but a night-shelter, affording little or no convenience for the necessary operations of the housewife. Independent of this, a public wash-house is, in point of economy, preferable to any number of isolated efforts. By co-operation, superior accommodation, better apparatus, and a cheaper and more satisfactory result can be obtained; and thus the public wash-house, where self-paying and self-supported, may be classed among the co-operative arrangements which characterize the social features of the age.

Mrs. Catherine Wilkinson of Liverpool, in a year of cholera, bravely offered the use of her small house, and the value of her personal superintendence, to her poorer neighbors, to facilitate the washing of their clothes at a time when cleanliness was more than usually important. The success attending the exertions of a single individual led to the formation of a benevolent society, and ultimately to important municipal arrangements.

In 1844, a public meeting was held at the Mansion House, attended by many persons of wealth and influence, to encourage the formation of B. and W. in London; hence resulted an "Association for Promoting Cleanliness amongst the Poor." Independently

of this movement, a reform had already been commenced by a "Committee for the Houseless Poor," who, among other things, purchased or rented an old roomy building in Glasshouse yard, surrounded by the poor and dense population of the London Docks district. A bath-house and a wash-house were fitted up; baths, cisterns, boilers, cold and hot water, towels, soap, soda, were provided; and the poor were invited to come in, and wash and bathe without expense to themselves. There were also provided pails, brushes, and whitewash, to those who would take the trouble to give a little cleanliness to their poor dwellings. This was effected mainly through the benevolent exertions of Mr. Bowie, a surgeon, who applied himself with earnestness to the subject. The association, afterwards founded at the city meeting, sought two objects—to induce a wish for cleanliness among the poor; and to render public B. and W. *self-paying*, as a guarantee for their permanency. Having obtained plans and estimates from architects, the association built a model establishment in Goulston square, Whitechapel; but the outlay unfortunately reached £26,000. In the mean time, another society had succeeded in establishing B. and W. in George street, Hampstead road, favored by a liberal arrangement on the part of the New River company in the supply of water: this establishment was opened in Aug., 1846. In the same year, parliament passed an act to enable borough-councils and parish vestries to establish public B. and W., supported by borough and parish rates, if the householders should sanction such a proceeding. In 1847, another act strengthened the former; and the two together contain the necessary clauses for defining the details of the plan (see the following article). The parish of St. Martin's-in-the-Fields was the first to take advantage of the new act; and before the close of 1852, six parishes had erected public B. and W. At the beginning of 1856, the list had nearly doubled. The original free but humble building in Glasshouse yard has been abandoned; and so likewise has the establishment in the Hampstead road; but the model building in Goulston square still remains. There were, in 1877, more than 20 of these public and parochial B. and W. in the metropolis.

It is not to be supposed that these efforts have been confined to London. Liverpool took precedence in date, and has since worthily maintained her interest in the matter. Manchester, Oldham, Hull, Bristol, Birmingham, Preston, Bath, Wolverhampton, Coventry, Plymouth, Chester, Sunderland, Bolton, Macclesfield, Oxford, Maidstone, Exeter, Rotherham, Colchester, South Shields, Dublin, Belfast, Glasgow, Dundee, Aberdeen, and other towns, have since adopted a similar course; and it may safely be predicted that borough and parochial B. and W. will increase in number year by year; for if they do not actually pay their full expenses at the low tariff charge, the deficiency will be so small as to be practically unfelt by ratepayers.

When the legislature took up the subject, the purpose of the committee appointed in 1844 was in great part answered; but that committee continued to exist until 1855; and the exertions of its members were attended with very beneficial results, in drawing the attention of influential persons in various countries to the advantages of public B. and W. The French government voted 600,000 francs to assist the promotion of such institutions in France, after the plan of the model establishment; and a scheme was set on foot for erecting fourteen establishments in Paris, for which 2,000,000 francs would be required. The municipality of Venice marked out an expenditure of £33,000 in the erection of B. on the same plan. The Norwegian government applied to the committee for the plans, etc., of their wash-house at Goulston square, as a guide for the erection of one at Christiania; and a subscription was made for the erection of B. and W. at Copenhagen. The Belgian government, and the authorities at Hamburg, Turin, Munich, Amsterdam, Lisbon, New York, and other places, were in like manner furnished with information on the subject.

In nearly all the London establishments, which may also be taken as types of those in the country, the characteristic features are as follows: The B. for males and females are on opposite sides of the building. The separate B., in large well-lighted and well-ventilated rooms, are shut in by walls, generally of slate; and the B. themselves, supplied with 50 or 60 gallons of water for each bather, are either of zinc or enameled iron. There are two, three, or four classes of B., charged differently according to the amount of accommodation afforded. At the St. Martin's establishment, where there are only two classes of B., it has been found that the second-class bathers are thrice as numerous as the first. Arrangements, slightly varying in different establishments, afford means for conveying hot and cold water to every bath. In some instances, there are tepid as well as cold swimming or plunging B.; while two or three of them afford facilities for shower and vapor baths. The washing-rooms, in most of these establishments, are provided with numerous small compartments, doorless and roofless, each for one person. Each compartment contains a boiler and a washing-tub, with taps for hot water, cold water, waste water, and steam: all unlimited in quantity, willful waste of course being guarded against. An American washing-board assists the operations; and a rack-work stand protects the feet. The steam from all the compartments is carried upwards to one great ventilating shaft. The "wringing" of the wet washed linen is effected by putting the articles into a sort of perforated cylinder, which is then rotated with great velocity; the centrifugal force drives out the water through the perforations and interstices, leaving the linen, though damp, much drier than it can be made by the familiar laundry process. The clothes are then taken to the drying-room, where they are hung on frames or "horses"

in small chambers heated with hot air to about 200° or 210°. 10,000 articles of washed clothing can now be dried with about £1 worth of fuel, or much less in the towns of the north. In some of the improved establishments, there is a drying compartment belonging to each washing compartment, effecting a manifest saving of time to the washers; in some of them, too, there is an ironing-board to each compartment; but the general plan is to have a large ironing-room, well provided with irons, ironing-blankets and boards, and heating arrangements. The charge is from 1*d.* to 2½*d.* per hour, according to the class and the accommodation.

One particular establishment at Manchester may usefully be described more in detail, as a type of the general class of B. and W. There is a men's swimming-bath, 70 ft. by 25, with a pavement of polished York stone on a foundation of concrete and cement; the sides are of porcelain tiles laid in cement. There are 32 inclosed dressing-closets. Over these, on iron pillars, are 17 men's warm baths, each 8 ft. by 7. Separated from this gallery by an open passage are 5 extra first-class baths, larger in size, and having shower-baths. There is a second-class swimming-bath nearly like that for the first class; with its gallery of small baths over. The women's baths, in a different part of the building, comprise 4 first and 7 second class. The laundry is at one end of the building. The washing-room is 64 ft. by 38; it comprises 6 first-class and 30 second-class compartments, each of the former provided with three tubs, and each of the latter with two. There is provision for drying any amount of clothes in 20 minutes after the washing and wringing are completed. All the women have access to two patent wringing-machines. There is an ironing-room adjoining, fitted up with stoves. The water-tank has a capacity of 3000 gallons; the baths, if all full, would hold 50,000 gallons.

Since the taking up of this subject by the municipal authorities of various towns, there have been few reliable statistics obtainable relating to the extent to which these valuable establishments are used; but it is known that the B. and W. established by the several parishes either pay their working expenses wholly, or approach so near to it as to encroach very little on the parish rates.

One satisfactory feature connected with the system is, that when the local authorities are slow to establish B. and W., wealthy manufacturers or townsmen often take up the matter at their own expense, and then leave the ratepayers nothing more to do than to provide the small balance of annual working accounts. As an example of free baths for men and boys (without wash-houses), may be cited the establishment opened at Derby in June, 1873, and presented to the corporation by Mr. Ball, M.P. for the borough. It comprises two swimming-baths, one for men and one for boys, each 100 ft. long by 50 in width. There are 57 half-closed dressing-boxes around the men's bath, and 73 open boxes around the boys'. The two baths together hold 260,000 gallons of water, which is renewed once a week.

The least satisfactory part of the system in its practical operation, is that which relates to the wash-houses. Laundresses, boarding and lodging house keepers, and families in the middle ranks of life, use these W. rather than really poor families; they do so because the expense is very low, not because they are unable to pay higher. It is sometimes believed that those for whose benefit the system was established are ashamed to bring their scanty, coarse, and much-worn apparel to a place where it may meet the eyes of others: if this be so, surely a remedy might be applied!

BATHS AND WASH-HOUSES, ACTS REGARDING. The establishment of public B. and W. is regulated in England and Wales by two acts of parliament—the 9 and 10 Vict. c. 74, and 10 and 11 Vict. c. 61—which are to be considered as one act. The sanitary regulations so legalized are merely permissive, and in no respect made compulsory on the public; but their wisdom, benevolence, and consideration for the health of the people, strongly recommend their adoption. The provisions of the act may be adopted for any incorporated borough, or for any parish not within any such incorporated borough; subject, however, in the case of a parish, to the approval of one of her majesty's principal secretaries of state. In the case of a borough, the adoption of the act is left to the discretion of the council of the borough; and the expense is to be charged upon the borough fund, the council being empowered to levy, either as part of the borough rate, or by a separate rate, such sums as may from time to time be necessary. In the case, again, of a parish, it is left to the vestry, with the sanction of one of the secretaries of state, to decide on the adoption of the act; and in such case, the vestry shall appoint not less than three, and not more than seven persons, ratepayers, to be *commissioners* for carrying out the provisions of the act. Regulations for the proceedings of these commissioners are prescribed in the act. The expense is to be charged upon the poor-rate. The vestries of any two or more parishes may concur in carrying out the act.

The act contains numerous other provisions and regulations relating to the facilities required for the operations of the borough councils and parish commissioners: thus, they may borrow money with the approval of the treasury; they may have money advanced to them by the public works loan commissioners; they may avail themselves of the railway companies clauses consolidation act of 1845 for certain limited purposes, such as borrowing money on mortgage, the accountability of officers of the company, the making of by-laws subject to other provisions, and the recovery of damages and penalties.

After these preliminary facilities, the act proceeds to specify the powers of the borough councils and parish commissioners, as to erection or purchase of buildings, etc., for the purposes contemplated. Among other things, it is provided that the number of baths and the number of washing-tubs for the laboring-classes shall not be less than twice the number of those for any higher class or classes.

The council and commissioners respectively are empowered to make by-laws for regulating the use of the B. and W., which, however, shall not be enforced until they have been approved by a secretary of state. These by-laws must make sufficient provision for a variety of purposes specified in the schedule (A) to the act 9 and 10 Vict. c. 47; the scope of those purposes being to secure order, cleanliness, and decency. The charges for the use of the B. and W. are regulated by another schedule attached to the act 10 and 11 Vict. c. 61. In the baths for the laboring-classes, a single cold bath is not to exceed one penny; a single warm or vapor bath is not to exceed twopence. B. for any higher class are not to exceed three times the charges for those of the laboring-classes. In the wash-houses for the laboring-classes, the use of a single washing-tub, and other conveniences, is not to be charged more than one penny for one hour, or threepence for two hours together.

The various local management acts, passed since the above-cited acts of 1846 and 1847, have strengthened the powers of town-councils, etc., for the establishment of B. and W.; but the principle of operation remains nearly uniform—viz., that any surplus outlay, beyond the receipts from bathers and washers, shall be defrayed out of the rates. It may safely be asserted that no item in house-rate is more wisely applied than this. So great is the importance attached by medical men to bathing, that the metropolitan board of works has been urged to establish free public swimming-baths in the metropolis, to supplement the parochial B. and W.; but the question is still undecided.

BATHS and WASH-HOUSES, PUBLIC (*ante*), are not established in the United States to any considerable extent except in some of the larger cities. In New York, Brooklyn, Boston, and some other places, there are large floating structures, with general and single dressing rooms, and an open space in the middle for swimming. There are separate baths, or separate days, for females, and the whole management is conducted and paid for by the city authorities. In 1879, there were four or five in the two rivers at New York; and during the hot season the bathers number many tens of thousands per day.

BATH-STONE, a building-stone extensively used in England on account of its beauty, is obtained from quarries in the Lower Oolite, in Wiltshire and Somersetshire. It is fine grained, of a rich cream color, and is composed of about 94½ per cent of carbonate of lime, and 2½ per cent of carbonate of magnesium, but is free from silica. It is easily wrought in the quarry, some beds cutting almost as readily as chalk, and hardens on exposure to the air, but is not very durable. Within twenty-five years after the reparation of Henry VII.'s chapel, in Westminster abbey, with this stone, it had begun to decompose. The name is derived from the neighborhood of several of the quarries to Bath.

BATH'URST, a name applied to various localities in honor of earl Bathurst, colonial secretary at the time.—1. B. *in New South Wales*, the first county that was settled beyond the Blue Mountains (q.v.), long believed to be impassable. It was not before 1813 that a practicable route was formed; and in April, 1815, governor Macquarie crossed the range by the newly made road with his lady and a numerous retinue, in order to mark with becoming "pomp and circumstance" so important an epoch in the growth of the colony. B. has been still further distinguished in the history of New South Wales as the seat of its gold-fields. As early as 1844, the precious metal had, on geological grounds, been supposed to exist in Australia; but it was only on 12th Feb. 1851, that Mr. Hargreaves, a digger of California experience, washed the glittering prize out of a tin dish of gravel on the Bathurst Plains. The county is bounded on the n.e. by the Macquarie, and on the s.w. by the Lachlan. The whole district is admirably adapted to pastoral pursuits. It is well watered, and, being 1970 ft. above the level of the sea, it has a moderate temperature. Its chief town, which is now the third in New South Wales, is a handsome city with numerous elegant public buildings, and was erected into a municipality in 1862. Pop. '71, of city and district, 16,826.—2. Bathurst Island, *off North Australia*, about lat. 12° s., and long. 130° east. It is fully 2° due w. of Port Essington, with Melville Island between. Its area may be estimated at 1000 sq. miles. Excepting the w. end, which is barren, the island is densely wooded.—3. B., the principal settlement of the British colony on the Gambia. It is situated on a small island at the mouth of the river, in lat. 13° 28′ n., and long. 16° 32′ west. Pop., about 3000, chiefly negroes. The principal buildings are the government house, an hospital for liberated Africans, and Wesleyan schools. The exports consist of gum, wax, hides, ivory, gold, tortoise-shell, rice, cotton, teak, palm-oil, and native cloths.—4. B., in Upper Canada, a district on the right bank of the Ottawa, here the boundary between the two Canadas. It contains the Rideau river and canal, thus occupying an important position with regard to the interprovincial trade. The removal, in 1858, of the seat of government to Ottawa, tended still further to promote the prosperity of the district.—5. B., an island in the Arctic ocean, intersected by the 100th meridian, and situated immediately

beyond the 75th parallel. Sherard Osborn here found the vertebræ of an ichthyosaurus —one of the few instances of organic remains occurring on the American side of the polar basin. See ARCTIC OCEAN.

BATH'URST, ALLEN BATH'URST, Earl of, 1684–1775; an English statesman. He was sent to parliament, in 1705, and distinguished himself as a supporter of the union of England and Scotland. In 1711, queen Anne made him a baron, and he won further distinction in the upper house by impeaching the directors of the notorious South Sea scheme. B. was a determined opponent of Walpole, and when that minister was forced to resign, B. was made a member of the privy council. In 1757, he became treasurer to the prince of Wales, and when the prince became George III., B. still continued in the privy council, but on account of age took no further action in politics. Lord B. was a generous patron of literature, and such writers as Congreve, Vanburgh, Swift, Prior, Rowe, Addison, Pope, Arbuthnot, Gay, and others, were happy in his acquaintance. Pope dedicated his *Epistle on the Use of Riches* to Lord B., and complimented him in characteristic lines. B. received further elevation to an earldom in 1762, and lived to see his son a baron and lord chancellor of England.

BATH'URST, Earl HENRY BATH'URST, an eminent tory statesman, b. 22d May, 1762, son of second earl (lord chancelor from 1771 to 1778), was in 1804 appointed master worker of the mint. In 1807, he became president of the board of trade, and was secretary of state for foreign affairs from 11th Oct. to 6th Dec. 1809. Appointed, 11th June, 1812, secretary for the colonies, in the administration of the earl of Liverpool, he held that office for sixteen years. In 1828, in the Wellington administration, he became president of the council, which office he retained till the resignation of the ministry in 1830. He died 26th July, 1834. At the time of his death, he was a teller of the exchequer, clerk of the crown, and elder brother of the Trinity house, K.G., D.C.L., F.R.S., F.S.A., etc. He was much esteemed by his party. His son, Henry George, succeeded as fourtn earl. He died in 1866, and was succeeded by his brother, William Lennox, fifth earl.

BATH'URST, RALPH, 1620-1704; uncle of lord B., an English physician, prelate, and wit. In medicine he rose to eminence, and in the time of the commonwealth was appointed physician to the state. After the restoration he abandoned medicine, took holy orders, was chaplain to the king, and afterwards dean of Wells. Later he was vice-chancellor of Oxford, and was offered the see of Bristol, which he declined. He was a perfect master of ridicule, and made that his weapon to correct college delinquents. Some of his verses in the *Musæ Anglicanæ* are excellent of their kind.

BATH'URST INLET projects s. about 75 m. from Coronation gulf in the Arctic ocean, 68° n., 111° w.; 300 m. from Great Slave lake.

BATHYÁNI. See BATTHYÁNYI, *ante*.

BATHYBI'IUS, the name given by Huxley to a low form of protozoan found in calcareous mud brought up by sea dredging. Prof. Huxley supposes this substance to cover a large part of the bed of the ocean, and to be a living expanse of transparent, gelatinous, or protoplasmic matter, growing at the expense of inorganic elements. Others regard B. not as an animal, but as slime enveloping foreign bodies and the remains of once living organisms, and also numerous living forms. Similar growth in fresh water is called "pelobius."

BATHYL'LUS of ALEXANDRIA, a freedman or favorite of Mecænas. He excelled in pantomimic dancing, and in the representation of comic characters.

BATIGNOLLES, a thriving t. of France, in the department Seine, n.e. of Paris, of which city it forms a suburb.

BATJAN. See BATSHIAN.

BATLEY, a Yorkshire t., near Dewsbury (q.v.).

BAT MALTHÆ'A, *Malthæa vespertilio*, a fish of the Atlantic ocean, noted for its extreme ugliness of shape; a monstrous aggregation of hideousness. It is something like a bat, and something like a scorpion; is covered with prickles and warts, with fins like wings armed with claws, goggle-eyed, and of a shape that defies measurement or delineation.

BATN-EL-HA'GAR (womb of rocks), a stony district, stretching along the Nile, in lat. 21° to 22° n., and long. 30° 40′ to 31° 10′ east. The Nile, in the upper portion of the district, is often forced by the approaching rocks into a very narrow channel, and its navigation is frequently interrupted by small islands, rocks, and cataracts. The district is peopled by Beduins, and other Arabs, who go naked and derive a scanty subsistence from beans and the fruit of a wild shrub called *kerkedan*.

BATON—variously written Battoon, Batune, and in old French Baston—is the figure in heraldry commonly known as the Bastard Bar (q.v.).

BATON is the name of a short staff presented by the sovereign to each field-marshal, as a symbol of his newly bestowed authority. It is also the name of the long staff carried by the drum-major of an infantry regiment.

BATO'NI, POMPEO GIROLAMO, 1708–87; a native of Lucca. He was regarded in Italy as the great painter of the 18th c., and did much to rescue the art from the intense mannerism into which it had fallen. His works, though not of a high order, are generally well designed and graceful. The group "Peace and War" is considered his best production. He painted a great number of pieces, and was also celebrated for his portraits.

BATON ROUGE, a city on the e. bank of the Mississippi, 129 m. above New Orleans, and formerly capital of the state of Louisiana. As far back as 1808 it was the seat of a college. Its pop. in 1870 was 6498, in 1880, 7,235. B. R. contains a national arsenal and barracks, a military hospital, an asylum for the deaf and dumb, state university, state penitentiary, an elegant state-house, four churches, and two newspaper offices. The district is very fertile, producing large quantities of cotton, sugar, and maize. B. R. was more than once the scene of important operations during the civil war.

BATRA'CHIA (from Gr. *batrachos*, a frog), in zoology, nearly synonymous with *amphibia*, the name of what is now generally regarded as a distinct class of the subkingdom *vertebrata*, intermediate in many respects between fishes and reptiles (q.v.). The B. used often to be treated as one of four orders into which the reptiles were divided. The most important difference between the B. and the reptiles is that the young B. undergo metamorphoses, and breathe by gills alone, in the earlier part of their life; whilst in their adult state they either breathe by lungs alone, or possess at once both lungs and gills. The body is also covered with a soft naked skin, through which water is imbibed, and through which the aëration of the blood appears to be in part carried on. The B. are all oviperous; their eggs are not covered with a hard shell, but merely with a soft membrane. Fecundation commonly takes place after the eggs have been deposited. It is sometimes given as a distinctive character of B., that, in their adult state, they have limbs, but in some genera these are very rudimentary, and they are altogether wanting in *Cæcilia* (q.v.), a genus which is now decidedly referred to this order, because it has been found to undergo the metamorphosis from a gill-breathing to a lung breathing state, and which Cuvier, with hesitation, placed among serpents, because the fact of its metamorphosis had not then been ascertained. The ordinary number of limbs is four, but in the *siren* (q.v.) there are only two.—Another character frequently given as distinctive of the B., that their feet are destitute of claws, is in like manner only general, and not universal.

In the earlier period of life, the form of the B. is fish-like, of which the common tadpole, the young of the frog, is a familiar example; and this form some of them retain with comparatively little modification, whilst some of them ultimately acquire a form resembling that of lizards, with which the newts were indeed ranked by Linnæus as species of the same genus; and others, as frogs and toads, assume a peculiar quadruped form, the tail entirely disappearing, except in the elongated coccygeal bone which represents it to the anatomist.

In their anatomy, the adult B. present some important points of resemblance to fishes; in some important points, they differ both from fishes and from other reptiles. The skull resembles that of fishes in its general form, although rather agreeing with other reptiles in the parts of which it is composed. Teeth are often entirely wanting, sometimes they are present only in one jaw; when present, they are generally small and numerous, either in a single row or aggregated. In some of the fossil genera, however, which are referred to this order, the teeth are of large size.—The B. have either no ribs, or they have mere rudimentary ribs. They have, however, a breast-bone, often in great part cartilaginous, to which some of the most important muscles are attached. They breathe air by a sort of gulping.—The heart of the B. was long believed to have only one auricle and one ventricle, but the apparently single auricle is now known to consist of two divisions. As in the class reptiles, only a part of the blood received from the circulating system is sent to the organs of respiration, and another part returns immediately into the circulation. See REPTILES.

In the wonderful transformations which the B. undergo, the circulation of the blood is changed in accordance with the change in the organs of respiration. These, in the earliest stage, are external gills, which appear as long colored fringes, hanging loosely upon each side of the neck. In some B., these external gills, which resemble those of the aquatic mollusca, remain till the lungs are sufficiently developed for respiration; in some, as the axolotl (q.v.), they are permanent during the whole of life. In the greater part of the B. however, the external gills soon disappear, and are replaced by internal gills, when the tadpole exhibits its most perfectly fish-like form, its mode of progression also corresponding with that of fishes. Its respiration is carried on essentially as in fishes, water entering the cavity of the mouth, and being forced out through the gill openings, so as to come in contact with the minute filaments of the gills. The gills are attached, as in fishes, to arches connected with the hyoid bone. In this stage of existence, the large arterial trunk which proceeds from the ventricle of the heart, sends forth, from a bulbous enlargement which it forms, as in fishes, an artery to each of the gills, and the blood after being aërated in them, is collected into an aorta, and proceeds into the general circulation. But an artery is also provided on each side for the conveyance of blood to the lungs, both the lungs and their arteries being at first rudimentary, but increasing,

whilst the gills, on the contrary, diminish along with the blood vessels connected with them; and the gill-breathing is gradually transformed into a lung-breathing animal, no longer perfectly aquatic, as at first, or capable of existence only in water, but amphibious, or almost entirely terrestrial, and incapable of remaining long under water without coming to the surface to breathe.—Whilst these changes take place, others no less extraordinary are also going on. The tadpole which subsisted on vegetable food, and possessed a mouth adapted to the purpose of feeding on it—a small horny beak—acquires a mouth fitted for seizing and swallowing small insects, slugs, etc., upon which the adult B. chiefly or exclusively feed, and his habits change accordingly. The mouth of the *siren*, however, always retains a character somewhat similar to that of the tadpole.—In the course of transformation, a pelvis is formed, and limbs sprout forth, which in some B., as frogs, become very perfect and powerful. Whilst the limbs grow, with all their bones, joints, muscles, blood-vessels, and nerves, the vertebræ, in many B., diminish in number, and the tail gradually shortens and disappears.

The extremely different characters of the adult B. suggest the idea of an arresting of the metamorphosis at different stages; but whilst this idea may be helpful to our understanding of the close affinities which really pervade the whole order, it must be remembered that it does not equally apply to all parts of the animal system; and that even as to those which have been particularly mentioned in the brief account above given of the metamorphosis of the B., some in their perfect state appear to have one part in what, for convenience, may be termed a more advanced state than another; whilst all are adapted with equal perfection to the situations in which they are appointed to live, both with reference to the wants of their own existence and the preservation of that of their species.

If the limbs of the tadpole or the frog are injured or destroyed during their growth, the loss is wonderfully repaired. This power of reproducing lost limbs continues to be possessed in an extraordinary degree by the adult newt (q.v.).

B. are generally inhabitants of warm or temperate climates. Those which inhabit temperate climates generally become torpid during winter. They are either almost entirely aquatic or are found in moist situations. The British species are very few. In some of the Scottish isles they are unknown.

B. are commonly divided into two sub-orders—*caducibranchiata*, in which the gills (*branchiæ*) disappear (are *caducous*), and *perennibranchiata*, in which they are persistent (*perennial*). The perennibranchiate Batrachia are comparatively few. Axolotl, siren, and proteus are examples. The caducibranchiate Batrachia are subdivided into *tailless* or *anourous*, as frogs, toads, etc.; and *tailed*, as newts, salamanders, etc. Some of the frogs and toads of warm climates are much larger than those of Britain; but the largest known B. are the *sieboldia maxima* of Japan, and *protonopsis horrida* of the Ohio (variously styled helibender, mud devil, ground puppy, young alligator, and fish salamander), both creatures of the newt or salamander form, the latter of which is 2 ft. long, and the former is of still greater size.

Fossil remains and footprints in rock attest the existence, in former geological periods, of B. of large size. "It is only in tertiary and post-tertiary strata that extinct species referrable to still existing genera or families of this order have been found." These occur both of the tailed and tailless forms. One of them has been a subject of particular interest, because its remains, when first discovered by Scheuchzer, in the beginning of the 18th c., were mistaken for the remains of a human being, and the discoverer enthusiastically urged them upon the attention of his contemporaries as a proof of the deluge. To this salamandroid fossil the name *andrias* (from the Gr. for man) *scheuchzeri* has been given.—Footmarks in the sandstones and shales of the coal-measures in Pennsylvania seem to have belonged to B. resembling frogs or toads, but of great size, some of the footprints being 2 in. in diameter, and a breadth of nearly 4 in. between the right and left footprints.—Some of the older batrachian fossils differ so widely from all existing types that new sub-orders have been formed for them. Those of the sub-order *ganocephala*—of which *archegosaurus* (q.v.) is the best known—are remarkable for having the head covered with bony plates; those of the order *labyrinthodontia*, for the labyrinthic structure exhibited in the transverse section of the teeth. See LABYRINTHODON.

BA'TRACHOMYOMA'CHIA (the War of the Frogs and the Mice), a Greek mock-heroic poem, erroneously ascribed to Homer, with whose works it has been generally printed. Pigres of Caria, who lived in the times of the Persian wars, was named amongst the ancients as its author. It is a parody on the *Iliad*, in which the military preparations and contests of beasts, with single combats, intervention of the gods, and other Homeric circumstances, are described with much humor.

BATRACHUS. See FROG-FISH.

BATSHIAN' (correctly BATJAN), one of the Moluccas, lies w. of Gilolo, between 0° 13′ to 0° 55′ s. lat., and 127° 22′ to 128° e. long. It belongs to the Dutch residency of Ternate, is formed of two peninsulas, and has many mountains. B. produces gold, copper, much coal, sago, cocoa-nut trees, rice, cloves, and fine timber. There are sulphur springs. Area, 900 sq. miles. Pop. 1800, a mixed race of Portuguese, Spaniards, Dutch, and natives. Chief t., Batjan, with 200 houses, on the e. coast.

BATTA, in relation to the British army in India, is an allowance in addition to the ordinary pay of officers. The pay is fixed; but the B. varies according to the part of the country in which the troops are placed, and also depends on the circumstance of their being in the field or in cantonments. If in the field, or more than 200 m. from the presidential government cities, the officers receive full B.; if in the garrison, or in cantonment within that distance, half batta. During the troubles of 1857 and 1858, the government was frequently embarrassed in determining whether particular officers were entitled to full or half B., owing to the confusion into which the whole military system was temporarily thrown.

BATTALION is the unit of command in infantry. It comprises the largest number of men who, when drawn up in array, can conveniently hear the word of command from an officer. In whatever ways the armies of Europe differ in other particulars, they seldom depart very far from a mean *war*-strength of 1000 men per battalion. Two or more of those units combine to form a *regiment* (with exceptions presently to be noticed); and those regiments are further aggregated into *brigades*, *divisions*, and *corps d'armée*, or other large groupings. The unit, or B., is divided into *wings*, and these into *companies* and *squads*. The continental regiments are for the most part so large as to comprise several battalions each; but the British infantry regiments, in time of peace, have mostly only one B. each. The usual way of increasing the British infantry in war-time is, not by creating new regiments, but by increasing the number of battalions per regiment, and of companies per battalion. In 1878, there were 110 regiments of line-infantry; of these, 83 had only 1 battalion each, 25 had 2 battalions, and 2 had as many as 4. The full complement of a B. is usually 12 companies; and when these are drawn up on parade, two ranks in depth, the two choice companies, called the "grenadier" and the "light-infantry" companies, are placed at the right and left extremities of the whole line; the other eight companies, each designated by a number or letter, being between them. In this form, the front of a B. of 1000 men is about 390 yards in length.

An English B. of 900 private soldiers approaches near 1100 strong when the officers, etc., are included. The following may be taken as the component elements, under the average *war* arrangements of the British service: 10 regimental staff-officers (lieut.-col., 2 majors, adjutant, instructor in musketry, surgeon, paymaster, and quartermaster); 36 company officers (capt., lieut., and sub-lieut.); 1 warrant officer (regimental school-master); 10 non-commissioned staff officers (staff and chief sergeants); 50 non-commissioned company officers (color-sergeants and sergeants); 900 rank and file (50 corporals, 850 privates, and 24 drummers).

The relation which the B. bears to the regiment, in various details of discipline and service, will be better noticed under REGIMENT; while a few related matters of a more general nature will be found treated under BRITISH ARMY.

BATTALION (*ante*). In the U. S. army, infantry regiments have one B.; cavalry and artillery have two. Detachments of more than a company and less than a regiment are frequently called battalions.

BAT'TAS, a people inhabiting that part of Sumatra between 0° 20′ and 2° 30′ n. lat. They claim to be the first settlers of Sumatra, and cling to the customs of their ancestors. The B. are light-brown, of middle stature, have somewhat prominent features, and long hair. They believe in a supreme Creator, and the influence of good and evil spirits. The men are lazy, and engage in hunting, while the women grow rice, collect pepper for trade, weave and dye cloth. They make white earthenware, iron implements, and ornaments of gold, copper, iron, and shells. Their houses are of wood, and the villages have earthen walls. The B. are nominally governed by the rajahs of Bata, Simamore, Salindong, and Bŭtar. The language is a Malay dialect, written on bamboos, in a peculiar alphabet, from the bottom upwards, but laid horizontally, and read from the left. A man may have many wives, paying a dowry of ten buffaloes for a chief's daughter, and five for one of lower rank. Cannibalism formerly prevailed, the victims being *only* murderers, prisoners of war, and adulterers. Women were never eaten.

BATTASZEK', a market-t. of Hungary, co. Tolna, on the w. of the Danube. Pop. '69, 6542.

BAT'TEL, TRIAL BY, or WAGER OF BATTEL. This relic of our legal barbarism is happily of the things of the past, having been abolished by act of parliament, the 59 Geo. III. c. 46, and might have been passed over with a brief notice, had it not been for a circumstance which we shall presently mention, and which affords a curious and striking illustration of a principle peculiar to the character of English law, as distinguished from the legal systems of other countries.

The trial by B. was a proceeding by way of appeal, and it obtained in civil and criminal cases, and also in military matters, to which, indeed, it was more appropriate. It consisted of a personal combat between the parties in presence of the court itself; and it was grounded on the impious idea of an appeal to Providence, the expectation being, that Heaven would give the victory to the innocent or injured party. In civil cases, the B. was waged by champions, and not by the parties themselves; but in criminal cases,

the parties fought in person, unless the appellor were a woman, a priest, an infant, or a man of the age of 60, or lame, or blind, all of whom might refuse the wager of B., and compel a trial by jury. Peers of the realm also could not be challenged to wage B., on account of their personal dignity, nor, by special charter, could the citizens of London, fighting being considered foreign to their education and employment. Whether by champions or in person, the mode of proceeding was the same. The appellee, or defendant, as he might be called, threw down his glove, and declared that he would prove his right, or defend himself with his body. The appellor, or prosecutor, in accepting the challenge, took up the glove, and replied that he was ready to make good his appeal, body for body; and thereupon the parties, holding each other's hands, joined issue before the court in a very formal and solemn manner. The weapons used were batons or staves an ell long, and a four-cornered leathern target, and the combatants were obliged to swear that neither of them would resort to sorcery or witchcraft! The B. lasted till the stars appeared in the evening, and the party who by that time had either killed or got the better of his opponent, was considered the successful suitor of justice. In a charge of murder, if the accused was slain, it was taken as proof of his guilt, and his blood was attainted; and if so far vanquished as not to be able or willing to fight any longer, he was adjudged guilty, and sentenced to be hanged immediately!

So late as the year 1818, this barbarous procedure was solemnly decided by the court of king's bench to be a valid and legal mode of trial, which the king's subjects were free to adopt! Of course, the principle was, that all laws, no matter how unsuitable to the times, could be enforced, unless expressly repealed by act of parliament. As a matter of curiosity, we may give the names of the parties (they were of the laboring-class) who seriously submitted their contention in the above form before lord chief-justice Ellenborough and his brother-judges of the period. The case is that of Ashford *v.* Thornton, and is reported in the first volume of Barnwall & Alderson's *Reports*, p. 405. As we have stated, the court decided in favor of the validity of the trial, one of the judges remarking that sufficient had not been stated to induce their lordships to refuse the B., and another more plainly and unequivocally observed that the defendant was "entitled to this his *lawful* mode of trial." But lord Ellenborough put the matter more clearly by stating, that "the general law of the land is in favor of the wager of B., and it is our duty to pronounce the law as it is, and not as we may wish it to be; whatever prejudices, therefore, may justly exist against this mode of trial, still, as it is the law of the land, the court must pronounce judgment for it." Happily, the pugnacious litigant who obtained this judgment was induced to go no further, and the above statute, the 59 Geo. III. c. 46, was passed, by which the shocking ordeal was wholly abolished.

In Scotland, we believe the matter would have been differently disposed of; for the judges there, following the doctrine of the Roman law, would have held the proceeding to have been in desuetude and obsolete, and there the matter would have ended. Mr. Rush, the then American envoy to the British court, thus justly remarks on this case in his *Residence at the Court of London* (published 1833). "To repeal laws belongs to the legislature. Courts expound and apply them. Free government is complex, and works slowly; tyranny is simple, and does its work at once. An absurd law may sleep in a free code, because overlooked; but whilst there, it is the law. It is so, I suppose, that we must reason; and generally, the reason would be right. Yet it might have been thought that, in a case like this, long disuse added to obvious absurdity, would have worked the silent repeal of the law, according to the doctrine of desuetude under the Roman code."

Montesquieu, in his *Spirit of Laws*, book 28, chapters 20 and 22, very ingeniously and plausibly deduces the modern practice of dueling and the so-called laws of honor from the above barbarous judicial combat. See ORDEAL.

BATTEN, or LAY, or LATHE, is the swing utensil of a loom, by which the weft or woof is struck home, and in which the shuttle runs. B. and lay are synonymous, B. being the English name, and lay the Scotch. See WEAVING.

BATTENS, a species of sawn fir timber, of smaller dimensions than the kind called planks. B. are usually from 12 to 14 ft. long, 7 in. broad, and 2½ in. thick. Cut into two boards (1¼ in. thick), they are used for flooring; cut into three boards, they are put on roofs below slates; in narrower pieces, they are put upright on walls for fixing the laths for plastering. The best B. are brought from Norway, and sold wholesale by wood-merchants.

BATTER, in architecture, used as a verb to express the manner in which the walls of towers, which are smaller at the top than at the bottom, slope inwards. The walls of wharfs, and those built to support embankments and the like, usually batter.

BATTERING-RAM, an engine of war used in ancient times, and in the middle ages. It consisted of a beam of wood, with a mass of bronze or iron on one end, resembling the head of a *ram* (in Lat. *aries*). In its simplest form, it was borne and impelled by the hands of the soldiers; afterwards, it was suspended in a frame, and made to swing. Another form moved on rollers. The alternating motion was communicated by ropes. To protect those working it, a wooden roof (*testudo*, was constructed over it, and the whole was mounted on wheels. The beam of the ram varied from 60 to 120 ft. in length, the head sometimes weighed above a ton, and as many as 100 men were employed

in impelling the machine. When the blows were long enough continued, hardly any wall could resist. When or where it was invented, is unknown. It is mentioned by Ezekiel. The Romans derived it from the Greeks.

BATTERSEA, a s.w. suburb of London, situated in Surrey, on the s. bank of the Thames, at the bridge to Chelsea, which is nearly opposite. It lies in B. parish, which is partly laid out in market-gardens for London, and has many manufactories. The church has a monument to the celebrated lord Bolingbroke. The flats, called B. Fields, once famed as a rich botanical station, are now formed into a public park. Adjacent to the park, the Thames is crossed by B. bridge (lately rebuilt), Albert bridge, Chelsea suspension bridge, and a railroad bridge. The first asparagus raised near London was grown by the market-gardeners of Battersea; but railways have much changed the locality.

BATTERY, in criminal law, means the beating or wounding, or more correctly, an assault by beating or wounding of another. Violence or force is not a necessary element in this offense, but the least touching, however trifling, of another's person in an angry, rude, insulting manner, is a B.; for the law, says Blackstone, cannot draw the line between different degrees of violence, and therefore totally prohibits the first and lowest stage of it, every man's person being sacred, and no one having a right to meddle with it in any the slightest manner. The remedy for an injury of this kind may be either by a civil action, as for damages, or by indictment, as for a misdemeanor. Where the B. is on a man's wife, the former may sue for damages by action of trespass, and it must be brought in the names of the husband and wife jointly; but if the maltreatment be so serious as to have deprived the husband for any time of his wife's company, the law then gives him a separate remedy, by an action in which he may recover special damage, on the ground of the loss of his wife's society, whilst suffering from the beating. By the common law procedure act, the 15 and 16 Vict. c. 76, the remedy for such ill usage is further varied, for by section 40 of that act, it is provided, that in any action brought by a man and his wife for an injury done to the latter, it shall be lawful for the husband to add thereto claims in his own right, and separate actions brought in respect of such claims may be consolidated, if the court or a judge shall think fit.

It is a good defense to prove that the alleged B. happened by accident, or that it was not in anger, or that it was merely the correction which a parent or master is entitled to use to a child, or scholar, or servant, or that it was done in self-defense, or in defense of a wife, a husband, a parent, a child, a master, or a servant; or that it was such personal force as a proper officer was entitled to employ, or that the defendant has already been summarily proceeded against under the 24 and 25 Vict. c. 100, by sections 44 and 45 of which act it is provided that further proceedings shall be barred where the complaint has been disposed of by two justices either by conviction or dismissal of the case, provided, in the former case, the defendant has paid the penalty, and suffered the imprisonment awarded; and, in the latter, the magistrates have dismissed the case, because it was justified, or so trifling as not to merit punishment, and this be forthwith certified under their hands.

In the Scotch law, there was what was called a B. *pendente lite*, which consisted in assaulting an adversary in a lawsuit during its dependence. This peculiar offense was created by two old Scotch statutes passed respectively in 1584 and 1594—and which curiously provided as a punishment the loss of the cause to the offender—but they were repealed in 1826 by the 7 Geo. IV. c. 19.

BATTERY, in military language, has two meanings: the one relating to field operations; the other, to fortification. A B. in field-operations consists of from 4 to 8 (in the British army, usually 6) pieces of ordnance, together with the necessary gun-carriages, ammunition-wagons, horses, artillerymen, and officers. A B. of foot-artillery (see ARTILLERY, ROYAL REGIMENT OF) is usually called a *field* B., as distinguished from a *horse* B. There are also *heavy* and *light* batteries, according to the weight of the ordnance. The term B. is also applied in a narrower sense to the *personnel*, or complement of men and officers attending such a set of guns. The designation for this used to be, in the foot-artillery, a *company*, and in the horse-artillery, a *troop;* but by an order issued in 1850, both these terms are now nearly superseded by the word B., thereby giving complexity to a term already used in two different meanings. The personnel of a field B. of six 12-pounder rifled guns, is thus composed: 1 major, 1 captain, 3 lieutenants, 1 surgeon, 1 battery sergeant-major, 1 battery quartermaster-sergeant, 6 sergeants, 4 corporals, 4 bombardiers, 66 gunners, 2 trumpeters, 1 farrier and carriage-smith, 3 shoeing-smiths, 2 collar-makers, 1 wheeler, 61 drivers (privates)—in all 158. In war, gunners and drivers would be added till the total strength of the battery became 277. Two batteries together form the command of a lieut col., and have the services of a veterinary surgeon between them.

The *matériel* of a 12-pounder B. of 6 guns comprises 6 carriages for the guns, 1 spare gun-carriage, 3 store-wagons, 1 store-cart, 1 forge-wagon, 1 rocket-wagon, 12 gun-ammunition wagons, and 6 wagons for small-arms ammunition for the use of the infantry. To draw these guns and vehicles are required in war about 212 horses, together with 35 saddle-horses, and 8 baggage-horses. The vehicles and boxes are prepared for the reception of 1284 rounds of ammunition for the guns, 150 rockets, and 98,280 rifle cartridges.

There is also carried a supply of empty cartridges, port-fires, fuses, quick match, slow match, and an immense number of tools and small articles, besides stores for the wheelers, shoeing-smiths, and collar-makers. Nearly all these supplies are equally divided, so as to make each independent of the others; but some of the stores are in reserve, for the use of the whole battery.

A B., in fortification, is a row of large guns of any number from 2 to 20 or upwards, mounted on an earthwork or other platform. It differs from an artillery or field B. in having no horses or vehicles immediately belonging to it. Siege-guns are mostly placed in or on such batteries; and when an army is preparing to resist the occupation of a particular place by an enemy, a B. of position is frequently one of the defensive means adopted. On the other hand, the fortifications on and within the walls of a stronghold generally obtain other names than that of B.; although particular rows of guns in certain places may be so called. Military engineers distinguish many different kinds of batteries, according to the nature of the duty which they are to fulfill, or of the ground on which they are placed. An *elevated* B. has the parapet raised above the ground; the earth for forming it being obtained from a ditch in front. A *half-sunken* B. has the interior slope sunk a little below the surface. A *sunken* B. has the base from 24 to 42 in. below the level of the ground. The guns mounted on these three kinds of batteries partake in the varying elevations of the batteries themselves, and are adapted to different modes of firing on the enemy. A *siege* B. consists of a range of heavy guns, for silencing the enemy's fire, ruining parapets and buildings, and making a breach through which infantry may enter. A *cavalier* B. is especially elevated, to fire over a parapet without embrasures. In the *Moncrieff* B., the gun is mounted so as to fire over a parapet 10 ft. high, the recoil causing it to descend after the shot. *Enfilade, en revers, en écharpe, ricochet, cross, oblique*, etc., batteries differ chiefly in the direction in which they pour out their fire. The distinction between *gun*-batteries, *howitzer*-batteries, and *mortar*-batteries, depends on the kind of ordnance employed. A mortar B. has a ditch of extra width, to afford spare earth for a platform of extra strength and solidity. A military engineer, in planning a B., makes his calculations in such form that the quantity of earth taken out at one spot may about equal that heaped up in another.

These batteries are all nearly alike in the general principle of their construction. They consist primarily of an *épaulement*, or built-up shelter, behind which the guns are placed; the platform on which the guns actually rest may or may not be above the ordinary level of the ground, according to the nature of the battery. The épaulement or parapet is of immense thickness, to resist the action of the enemy's cannon balls. The thickness at the top is seldom less than 12 ft., and may be as much as 20; for it is found that a 24-pounder ball will penetrate 18 ft. of earth. The guns are placed about 20 ft. apart, behind the parapet. Some batteries are straight, with all the guns parallel; while others may be portions of a triangle (*redan*) or a polygon, and the earthwork has to be constructed accordingly. There is generally a ditch from 12 to 20 ft. wide, outside the earthwork; and the depth from the crest of the parapet to the bottom of the ditch is 12 to 16 feet. For gun and howitzer batteries, there are embrasures through which the firing takes place; but mortar batteries are without those openings.

Sometimes the épaulement is thrown up loosely, in haste; but for the better kinds of batteries, fascines, gabions, and sand-bags are largely employed. The main structure is lined with fascines 9 ft. long, and the embrasures lined with other fascines 18 ft. long—40 or 50 of the two kinds being required per gun. The fascines here spoken of are long bundles of brush-wood, weighing 30 to 200 lbs. each. Sometimes sand-bags are used instead of fascines, each containing about a bushel of sand or earth; and sometimes gabions, which are wicker cylinders filled with earth. A 6-gun sand-bag B., made wholly of these materials, requires nearly 8000 sand-bags.

The fate of a field B. often decides a battle. At the battle of the Alma, when once the guards and highlanders had reached the Russian batteries on the hill, the day was won. At the battle of Inkermann, the issue depended mainly on the possession of a small 2-gun sand-bag B., which remained, after many vicissitudes, in the hands of the allies.

BATTERY (*ante*), in criminal law, any unlawful beating or other wrongful physical violence or constraint inflicted upon a person without his consent. B. must be wilfully committed or result from want of care. An injury done in an angry, rude, or spiteful manner, such as spitting on a person, or even touching him in anger, or to insult, or annoy, is a B.; or it is a B. if one strike a cane in the hands of another. But B. may be justified, as in a parent's correction of a child, or a schoolmaster's discipline of a scholar, or as a means of preserving the peace, or of defense, or the protection of others; but in such cases the B. must not exceed the necessary amount; and a B. may also be justified in defense of one's property.

BATTERY, Floating. See Floating Battery.

BATTERY, Electric and Galvanic. See Electricity and Galvanism.

BATTHYAN'YI, one of the oldest, richest, and most celebrated families of the Hungarian magnates, which can trace its origin as far back as the invasion of Pannonia by the Magyars, in 884 A.D., and which has given to Hungary many warriors and statesmen. The surname is derived from lands obtained in the 14th c.—Balthasar von B., who was the head of the family in the latter half of the 16th c., fought with distinction in the

Turkish wars, and constantly maintained at his own expense 1200 infantry and 500 cavalry.—Charles, prince of B., a lieut. field-marshal of the empire, distinguished himself in the Bavarian war of succession, and particularly by a victory over the French and Bavarians at Pfaffenhofen on 15th April, 1745.—Count Casimir B., a member of the principal branch of the family, was b. 4th June, 1807. He was minister of foreign affairs in Hungary during the insurrection in 1849, in which he also distinguished himself as a military governor. After the catastrophe of Vilagos, he fled, along with Kossuth, into the Turkish territory, where he remained till 1851. He then went to France, and d. at Paris, 13th July, 1854. Count Louis B., belonging to another branch of the same family, and b. at Presburg in 1809, having espoused the national cause, yet seeking to maintain the connection with Austria and his allegiance to the Austrian sovereign, was appointed president of the ministry, when Hungary obtained a ministry of its own, in Mar. 1848. His ability was not equal to the goodness of his intentions, and the circumstances in which he was called to act were very difficult and embarrassing. He did not hold the office long, and afterwards took part in public affairs, chiefly as a member of the diet, and with great moderation. Yet, after the Austrians entered Pesth, he was arrested in Jan. 1849, and on 6th Oct. was executed by sentence of martial law. His condemnation was unexpected, and awakened the more sympathy, because all men regarded it as unjust.—A prince B. occupies at present a prominent position on the turf, winning the Derby of 1876.

BATTICALO'A, a t. in the eastern province of Ceylon, on an island, 7° 44′ n., 81° 52′ e.; pop. 3353. It is important for its haven and adjacent salt lagoons. There is a fort, and a small English settlement. Pop. of the district, 93,220.

BATTLE, a t. in e. Sussex, 8 m. n.w. of Hastings, where the country rises in wooded swells. Consisting of one street, built along a valley extending from n.w. to s.e. Pop. '71, 3495. It is noted for its manufacture of gunpowder, well known to sportsmen as B. powder. It was anciently called Hetheland or Epiton, and derives its present name from the battle (usually called the battle of Hastings), fought on the heath between it and Hastings, on 14th Oct. 1066, when the Normans, under William the conqueror, final overthrew the Saxon dynasty in England. William, to commemorate his victory, founded in 1067, on the spot where Harold's standard was taken, a splendid abbey, which was endowed with all the land within a league of it. The abbey had the privileges of a sanctuary, and the conqueror's sword and a roll of his barons were deposited in it. The existing ruins, which belong to a building erected after the original abbey, occupy 3 sides of a quadrangle, and are a mile in circumference.

BATTLE is a combat between large masses of troops, or whole armies. Every B. ought to have for its object the determination, if possible, of the whole contest, or at least the effecting of some important step to that end. It is therefore the aim of a general to bring about an engagement at the decisive point. This constitutes strategy, while tactic is concerned with the handling of the troops in the actual battle. Victory on the battle-field is not enough for a general; it is only by following up his victory to the annihilation, if possible, of the beaten army, that its fruits are secured. ORDER OF BATTLE is the particular way in which the several corps of different arms are disposed for entering into an engagement. It varies at different times, and is modified according to locality.

No general account of a B. can be given. Information on the various elements of which a B. consists will be found described under such heads as ATTACK, ARTILLERY, CAVALRY, INFANTRY, CHARGE, FLEET, GUNNERY, TACTICS, etc. The more important individual battles will be found described, in their causes and results, under the names of the places with which they are associated.

Considered in their political relations, the importance of battles is not always in proportion to their magnitude. "There are some battles which claim our attention, independently of the moral worth of the combatants, on account of their enduring importance, and by reason of their practical influence on our own social and political condition, which we can trace up to the results of those engagements. They have for us an actual and abiding interest, both while we investigate the chain of causes and effects, by which they have helped to make us what we are; and also while we speculate on what we probably should have been, if any one of those battles had come to a different termination."—Prof. Creasy's *Fifteen Decisive Battles of the World, from Marathon to Waterloo.* The fifteen battles which, in prof. Creasy's opinion, have had the most decisive influence, are the following:

B.C.
490. Battle of Marathon.
413. Defeat of the Athenians at Syracuse.
331. Battle of Arbela.
207. " " the Metaurus.

A.D.
9. Defeat of the Romans under Varus.
451. Battle of Chalons.
732. " " Tours.
1066. Battle of Hastings.
1429. Joan of Arc's victory at Orleans.
1588. Defeat of the Spanish Armada.
1704. Battle of Blenheim.
1709. " " Pultowa.
1777. Defeat of Burgoyne at Saratoga.
1792. Battle of Valmy.
1815. " " Waterloo.

BATTLE, WAGER OF. See BATTEL.

BATTLE-AXE was a weapon much used by the early northern nations, Celtic and Scandinavian, requiring great strength in its use. Some were held with one hand, some with two; the former kind could be wielded equally by horse and foot, but the latter was for foot-soldiers only. The B. had a longer handle, and a broader, stronger, and sharper blade than the common axe. During the middle ages, and somewhat earlier, it was much used in sorties, and to prevent the escalading of a besieged fortress. The *pole-axe* differed but little from the battle-axe. The *black bill* and *brown bill* were a sort of halbert, having the cutting part hooked like a woodman's bill, with a spike projecting from the back, and another from the head. The *glaive* was a kind of pole-axe or bill used by the Welsh.

BATTLE CREEK, a city in Calhoun co., Mich., on Kalamazoo river, at the crossing of the Michigan Central and the Peninsular division of the Chicago and Lake Huron railroads; 121 m. w. of Detroit; pop. 5323; in '80, 7592. There are manufactures of flour, woolens, etc., and in the neighborhood are quarries of superior sandstone.

BATTLEMENT, a notched or indented parapet used in fortifications. The rising parts are called cops or merlons; the spaces by which they are separated, *crenels*, embrasures, and sometimes loops. The object of the device is to enable the soldier to shelter himself behind the merlon, whilst he shoots through the embrasure. The bas-reliefs of Nineveh, and the Egyptian paintings, testify to its antiquity, and there is perhaps no nation by which it has not been adopted.

BATTLE OF THE SPURS, the first important conflict between the burghers and the nobles at Courtrai, in 1302, the French nobility being utterly defeated. They rushed forward with loose reins and fell into a great ditch; their army was annihilated, and among the spoils were 4000 spurs of gold.

BATTLE-PIECES are paintings representing battles. The modern mode of warfare is less favorable for this branch of art than the ancient, where personal valor had more room to display itself. Among the greatest paintings of this kind are the battle of Constantine, sketched by Raphael, and executed by Giulio Romano; Lebrun's battles of Alexander; and the battle of the Amazons by Rubens. In smaller scenes, such as skirmishes and surprises, Antonio Tempesta, Hans Snelink, Pet. Snyders, Fulcone, Phil. Wouverman, etc., are distinguished. The most eminent of recent battle-painters is Horace Vernet.

BATTUE (from Fr. *battre*, to beat). The B. is a method of killing game on a great scale, by causing animals to be driven forward to a point where a number of shooters are waiting to shoot them. The driving is effected by beating the bushes; hence the term battue. This term, like the practice which it imports, is only of modern date; yet a plan of killing deer by driving them forward in herds in an ever-narrowing circle to a place where they are to be shot, is an old usage in the Highlands, where it is called the *tinchel*. The B. is at best a commonplace and butcherly amusement, for it can scarcely be said to have the merit of being attended with even a reasonable degree of exercise and excitement. It is practiced chiefly in extensive preserves of pheasants and hares during the autumn and winter months, when country gentlemen invite acquaintances to their mansions for the sake of field-sports. The B. takes place early in the day, and with good arrangements it is attended with neither fatigue nor danger. The number of shooters is usually eight or ten, each provided with at least two guns, which are loaded by an assistant as quickly as they are discharged. When the shooters are stationed at safe distances from each other, and ready to commence work, the beaters begin theirs by driving the game before them. Sometimes, however, pheasants will run a long way before rising on wing, and to make them take to flight on approaching the guns, a low net is stretched across their path. It should be stated, however, that in the B., hares, rabbits, etc., are shot as readily as pheasants; and at length the ground is covered with slain, like a field of battle. By means of the B., large quantities of game are killed, and sent to market; the profits derived from this species of stock on some estates amounting to no inconsiderable sum annually. For an account of battue shooting, we refer to *The Shot-gun and Sporting Rifle*, also *Stonehenge's British Rural Sports* (London, 1875).

BATTUS, founder of the Greek colony of Cyrene, in Libya, directed there by the Delphic oracle, about 650 B.C. He ruled 40 years and was succeeded by his son B. II., called "the prosperous," under whom the colony rapidly increased, land being given free to immigrants from Greece. The next of the Battiadæ on record was Arcesilaus II., about 554–44 B.C., who was defeated by the revolted Libyans, and strangled by his brother Learchus. The next heir, B. III., was lame; Demonax of Mantinea was the real ruler. The wife and son of the lame king, however, recovered the sovereignty, but the son, Arcesilaus III., was slain by fugitives from Cyrene while hiding from vengeance in Barca. The mother made war upon Barca and perpetrated great cruelties in revenge for the death of her son, but she soon after died miserably in Egypt. There followed a B. IV., and soon Arcesilaus IV., with whom the dynasty ended. The latter won a victory in chariot racing during the Pythian games, and was eulogized by Pindar

BATUM', or BATOUM', formerly a Turkish fortified city, now a Russian free port on the eastern shores of the Black sea. The Berlin congress of 1878, in sanctioning the cession of B. to Russia, stipulated that it should not be made into a naval station, but should remain an essentially commercial port. The harbor is one of the best on the e. coast of the Black sea. A pretty extensive trade is carried on. Hides, wax, honey, and, above all, oak for ship-building, are the principal exports. B. has about 3000 inhabitants, mostly Turks and Lasians, or Laz. Great ruins of Greek churches and other buildings are found in the neighborhood.

BATURIN, a t. of Russia, in the government of, and 78 m. e from, the city of Tchernigov, on the Seim. It was founded by Stephen Bathory, king of Poland, and was at one time the favorite residence of the hetmans of the Cossacks, of whom Mazeppa, who, in 1708, sold himself to the Swedes, is the most notorious. The palace of the hetmans, with its once beautiful grounds, is now going rapidly to decay.

BATU'TA, IBN (MOHAMMED-IBN-ABDALLAH), 1302–78; a Moor who traveled extensively in Asia and the eastern islands, Africa, and Spain. He wrote full observations, but only extracts or epitomes have been preserved.

BAUD, a t. of the dep. of Morbihan, France, situated on the Evel, 20 m. n.w. from Vannes. Pop. 76, 1496. B. has some trade in grain, cattle, hemp, butter, and honey. Near B. is a statue of granite, known as the "Venus of Quinipily," worthless as a work of art, but remarkable on account of its history. Its origin is unknown, but it is supposed, from its Egyptian character, to be a Gallic Isis. Down to the 17th c., it was worshiped with foul rites, and even now is regarded with superstitious veneration by the peasantry. It appears to have been first called Venus in inscriptions on the pedestal set up in 1689.

BAU'DEKYN, a corruption of Baldachin (q.v.).

BAUDELAIRE, CHARLES, 1821–67; a French poet, one of the curious class now known as "Bohemians." Some of his writings are gross, while some, especially his little poems, are very beautiful; but nearly all are in the romantic, or rather ecstatic, vein of affectation peculiar to writers of intolerable egotism. The only work of B.'s which has a living power is his translation of the writings of Edgar Allan Poe, which is pronounced one of the most brilliant and faithful translations of the age.

BAUDELOCQUE, JEAN LOUIS, 1746–1810; a French surgeon, especially devoted to obstetrics, in which he gained great reputation. He was one of the earliest to use forceps in difficult parturition. Napoleon selected B. to attend on the confinement of Maria Louisa.

BAUDRILLART, HENRI JOSEPH LÉON, b. Paris, 1821; a political economist and author, editor of the *Journal des Economistes*, and connected with *Des Debats*, being son-in-law of the editor. In 1866, he was appointed professor of history and political economy in the college of France. He has written many works, chiefly upon his favorite themes of political economy.

BAU'ER, BERNARD, of a Jewish family, b. Hungary, 1829; served in the French army and became a convert to Roman Catholicism, joining the Carmelites. He was chaplain at the Tuileries, and a special favorite of the empress Eugenie. During the siege of Paris he was chaplain of the ambulances of the press. His lectures and some political pamphlets are published.

BAU'ER, BRUNO, a celebrated biblical critic and philosopher, belonging to the extreme school of German rationalism, was b. at Eisenberg, in the duchy of Saxe-Altenburg, on the 6th Sept. 1809. He is the son of a porcelain-painter, and studied at the university of Berlin, where he became doctor of theology in 1834. From this period he has devoted himself exclusively to what is termed in Germany the scientific criticism of Scripture—that is to say, a criticism based on the conviction, that the contents of the Bible have a natural, and not a supernatural origin, and ought to be subjected to the same process of philosophical analysis as other human productions are. In 1839, B. became a *privat-docent* in the university of Bonn, but in 1842 was forbidden to deliver any more theological lectures. He then removed to Berlin, where he has since resided. He has passed through various stages of anti-supernaturalism. At first, he contented himself with believing that the substance of the Christian religion might be extricated from the entanglements of a confused and erroneous system of interpretation. Such is the idea that runs through his earliest works, his *Criticism of Strauss' Life of Jesus*, published in the Berlin *Year-book of Scientific Criticism* (1835–36), his *Journal of Speculative Theology* (1836–38), and his *Critical Exposition of the Religion of the Old Testament* (Berlin, 1838). He soon, however, advanced so far in his "scientific" demands, that it became quite clear the Scriptures, in his eyes, had lost even the moderate authority which he originally supposed them to possess. To this period belong his *Doctor Hengstenberg*, (Berlin, 1839), and *The Evangelical Church of Prussia and Science* (Leip. 1840). In the former of these works, B. appears as an opponent of the school of apologetic theologians, and exposes what he conceives to be the weakness of their system as a method of apprehending characteristic differences in the historical development of Christian doctrine; in the latter, he wished to prove that true philosophic union is the dissolution of the outward dogmatic

church in the realm of the universal and free self-consciousness—language which is not very intelligible to the finite Anglo-Saxon mind. In his *Critique of the Evangelical History of John* (Brem. 1840), and *Critique of the Evangelical Synopticists* (Leip. 1840), he attempted to show that the so-called facts of the gospel never really had a historical existence, and that those artistic compositions which we term the gospels, were simply the product of the human self-consciousness. B. considers Strauss, a mere apologetical theologian, a comparatively orthodox writer! and regards his conclusions with the supercilious contempt of one who has reached a far higher elevation, while he conceives that his own special work in this world has been to strike off the last head of the hydra of the tradition-hypothesis. The persecutions to which he was now subjected brought about a complete rupture between him and the church, the consequence of which was a brochure entitled *The Question of Liberty, and my own Private Affairs* (Zurich, 1843). Then followed his *Christianity Unveiled* (Zurich, 1843), in which he expressed the same conviction that he had previously done in two ironical treatises—viz., that a dogmatic religion was opposed to our self-consciousness. About this time he broke with his old friends, the liberals, by writing a pamphlet against the emancipation of the Jews, *Die Judenfrage* (Brunswick, 1843). This tractate forms the transition point to the third period of B.'s intellectual activity, in which he seems to have abandoned theology altogether as something hopeless. He now occupied himself exclusively with literature and political philosophy. The number of his writings in this department is very great. The principal are, *History of the Politics, Civilization, and Enlightenment of the 18th Century* (Charlottenburg, 1843–45); *History of Germany during the French Revolution and the Reign of Napoleon* (Charlottenburg, 1846); *History of the French Revolution until the Establishment of the Republic* (Leip. 1847); *Western Dictatorship; The Actual Position of Russia; Germany and Russia; Russia and England.* The prominent idea in the whole of his works belonging to this period is, that the failure of the popular and national struggles in the 19th c. results from the essential weakness of the "enlightenment" of the 18th century. More lately B. has again returned to theology. In 1850–51, appeared his *Critique of the Gospels and the History of their Origin*, and his *Critique of the Epistles of St. Paul*, the latter of which the author considers wholly apocryphal, and written during the 2d century. Besides the works mentioned, B. has composed various other treatises on important points of history, theology, and politics. All B.'s writings exhibit great learning, industry, research, and acumen; but are completely antagonistic to the received opinions in theology, or to any form of evangelical religion. He is generally admitted to be quicker in the discovery of error than of truth. His latest work is *Philo, Strauss, Renan, und das Urchristenthum* (1874).

BAU'ER, GEORG LORENZ, 1755–1806; a German theologian who taught that the Bible, like the old classics, must be interpreted by historical and grammatical lights, and not with regard to religious doctrines. He was the first to write a systematic exposition of the Christian dogmas as they are contained in the Bible, and in each book in particular. He was an accomplished oriental scholar, translating much from the Arabic and other eastern tongues.

BAUGÉ, a t. in the department of Maine-et-Loire, France, 23 m. e.n.e. of Angers. The English, under the duke of Clarence, were defeated here in 1421. Pop. '76, 3318, who are engaged in the manufacture of linens and woolens.

BAUHIN, GASPARD, 1560–1624; a French physician and botanist, b. in Switzerland; professor of anatomy and botany in the university of Basel in 1588, afterwards rector and dean of the faculty. His works on botany, catalogues, etc., were better than others of his time, and a work of his on anatomy is commendable.

BAUHIN, JEAN, 1541–1613; brother of Gaspard, a student of the botanist Fuchs and companion of Gesner in collecting plants. He also practiced medicine, and in his later life was physician to the duke of Würtemburg. He wrote a work on the medicinal waters of Europe; but his great work on plants was left unfinished. B. is considered one of the founders of botanical science.

BAUHIN'IA, a genus of plants of the natural order, *leguminosæ*, sub-order *cæsalpineæ*. The upper petal is somewhat remote from the rest. The leaves are generally divided into two lobes. The species are natives of the warmer regions of both hemispheres, and some of them are remarkable for the size and beauty of their flowers. Most of them are twining plants or *lianas*, stretching from tree to tree in the tropical forests; but some are small trees, as *B. porrecta*, the mountain ebony of Jamaica, so called from the color of its wood. The inner bark of *B. racemosa* (the Maloo climber), of *B. scandens*, and of *B. parviflora*, East Indian species, is employed for making ropes. *B. retusa* and *B. emarginata*, also East Indian, exude a brownish colored mild gum; whilst the astringent bark of *B. variegata* is used in Malabar for tanning and dyeing leather, and also in medicine. The leaves of various species are used in Brazil as demulcent medicines, having mucilaginous properties—Livingstone mentions a species of B. in s. Africa, called the mopané tree. It is remarkable for the little shade which its leaves afford. They fold together and stand nearly erect during the heat of the day. On them the larvæ of a species of *psylla* cause a saccharine secretion, in circular patches, beneath which the pupa of the insect is found. The natives scrape it off and eat it as a dainty.

BAUMÉ, ANTOINE, 1728–1804; a French chemist, distinguished for success in the practical application of the science. He became a professor in the college of pharmacy, kept a large establishment for the preparation of drugs, and published many papers on chemistry, and arts and manufactures. Among his inventions and improvements were a process to bleach raw silk, the manufacturing of sal ammoniac, of improved scarlet dyes, and a cheap process for purifying saltpeter. He published several works on his favorite theme of chemistry. He made for the areometer a scale which is still used.

BAUMGAR'TEN, ALEXANDER GOTTLIEB, a clear and acute thinker of the school of Wolf, was b. at Berlin on the 17th of July, 1714, studied at Halle, and in 1740 became professor of philosophy at Frankfort-on-the-Oder, where he died on the 26th of May, 1762. He is the founder of æsthetics (q.v.) as a systematic science of the beautiful, though his mode of treatment is objected to by the more transcendental Germans, as being purely psychological; that is to say, he makes æsthetics only a portion of the philosophy of the senses, and contrasts it with logic, which belongs to the sphere of the reason. The idea of a science of the beautiful first appears in his treatise, *De Nonnullis ad Poema Pertinentibus*, published at Halle, 1735. In 1750–58, he issued two volumes of his *Æsthetica*, but his death hindered the completion of the work. His writings in other departments of philosophy are marked by clearness and precision; his *Metaphysica* (Halle, 1739; 7th edition, 1779) is still considered one of the most useful books for the study of the Wolfian philosophy.

BAUMGARTEN, MICHAEL, b. 1812; a German theologian; studied at Kiel, became professor at Rostock, and a prominent and energetic defender of the Protestant association.

BAUMGARTEN-CRUSIUS, LUDWIG FRIEDRICH OTTO, a German theologian, b. at Merseburg, 1788, and d. at Jena, 31st May, 1843. He studied theology at Leipsic, and in 1810 became university preacher. In 1817, he was appointed professor of theology at Jena, and always distinguished himself as a champion of religious liberty, on behalf of which he wrote various treatises. In 1820 appeared his *Introduction to the Study of Dogmatics* (Leip. 1820), a work of considerable originality and richness of thought. More complete exhibitions of his opinions are to be found in his *Manual of Christian Ethics* (Leip., 1827); *Outlines of Biblical Theology* (Jena, 1828); and *Outlines of Protestant Dogmatics* (Jena, 1830). In 1831–32, he published a *Text-book of the History of Doctrines;* in 1834, a work on *Schleiermacher, his Method of Thought, and his Value;* and also *Considerations on certain Writings of Lamennais.* After his death, Kimmel published the whole of his exegetical prelections on the gospels and Pauline epistles.

Baumgarten was conspicuous for the breadth and solidity of his learning, the originality of his spirit, and the acuteness of his understanding, but was nevertheless deficient in clear and vivid expression. He attached himself to no school, theological or philosophical. At an early period, he had been greatly influenced by the metaphysics of Schelling, from which, however, he ultimately emancipated himself. His thinking was, to a certain extent, rationalistic, but on the whole approached more closely to the direction of the spiritual Schleiermacher.

BAUMGARTNER, ANDREAS RITTER VON, or Chevalier de, was b. at Friedberg, in Bohemia, 23d Nov., 1793, and studied at Vienna, where, in 1823, he became professor of natural philosophy. Whilst filling this office, he gave popular lectures on Sundays upon mechanics, etc., for artisans and operatives, which met with much approbation. A result of these lectures was his *Mechanik in ihrer Anwendung auf Künste und Gewerbe* (2d ed., Vienna, 1823), and his *Naturlehre* (Vienna, 1823). An ailment of the throat induced him to resign his professorship, but he was appointed director of the imperial porcelain, mirror-glass, and smalt manufactories, and afterwards superintendent of tobacco manufactories. In the year 1846, the setting up of the electric telegraph was committed to him, and he was intrusted with the principal charge of the making of the Austrian railways. After the events of Mar., 1848, he was minister of mines and of public buildings, and chief of one of the departments in the ministry of finance. In May, 1851, he was appointed minister of commerce, trade, and public buildings. At the same time, he was appointed president of the Austrian academy of sciences, of which he had been vice-president for a number of years. He published, in 1862, *Chemie und Geschicte der himmelskörper nach de Spectral-analyse;* in 1864, *Die mechan. Theorie der Wärme.* He d. in 1865; and *Freiherr Von B., Eine Lebensskizze*, was published during the following year.

BAUMGARTNER, GALLUS JAKOB, 1797–1869; a politician and historian of Switzerland, the son of a mechanic. He studied law, and was a leader of the liberals, but afterwards associated with the ultramontanes. He has been a member of a number of legislative bodies.

BAUPET'TAH, a t. of British India, in the presidency of Madras, 29 m. from Guntoor. Pop. supposed to be about 20,000.

BAUR, FERDINAND CHRISTIAN, the founder of the "New Tübingen School of Theology," was b. on the 21st of June, 1792. In 1817, he became professor in the seminary of Blaubeuren, where he gave the first indications of his remarkable abilities by the publication of his *Symbolism and Mythology, or the Nature-religion of the Ancients* (Stuttgart, 3

vols., 1824–25), a work which indicates the influence of Schleiermacher over the author. In 1826, he was called to Tübingen, where he held the chair of Protestant theology. His whole life was consecrated to religious studies—the history of doctrines, the symbolism of the church, and biblical exegesis. On account of the universality of his culture, the wonderful activity and fertility of his mind, his rare combination of speculative thought with solid knowledge, and that faculty of historic divination or insight which enabled him to draw decisive results from separate, obscure, and neglected *data*—he has been regarded by many in Germany as the most massive theological intellect since Schleiermacher. Unlike Bruno Bauer, he made comparatively little use of the Hegelian philosophy in his writings; and when he did, it was professedly only that he might more clearly understand historical phenomena in their internal spiritual connection, and be enabled to represent the logical process of their development. His method of investigating the progressive history of religious opinion, however, incurred the reproach of formalism from its adversaries, who said that he applied it too rigorously, and made dogmas develop themselves with a kind of abstract inevitable regularity from previous historical conditions, without allowing for immediate and extraordinary providences. His most important works in the history of doctrine are *Die christliche Gnosis oder die christliche Religionsphilosophie* (Tübingen, 1835), (The Christian Gnosis, or the Christian Philosophy of Religion); a work which makes the Christian Gnosis of the 2d and 3d centuries the starting-point of a long series of religio-philosophical productions traceable uninterruptedly down through middle-age mysticism and theosophy to Schelling, Hegel, and Schleiermacher; *Die christliche Lehre von der Versöhnung* (Tübingen, 1838), (The Christian Doctrine of the Atonement); and *Die christliche Lehre von der Dreieinigkeit und Menschwerdung Gottes* (Tübingen, 1841–43), (The Christian Doctrine of the Trinity and the Incarnation). In reply to Möhler, the celebrated Roman Catholic theologian, who had attacked the Protestant church, he wrote *Der Gegensatz des Catholicismus und Protestantismus* (Tübingen, 1836), (The Opposition between Catholicism and Protestantism). Besides these works, based on a historical treatment of religion, to which class also belongs his *Lehrbuch der christlichen Dogmengeschichte* (Compendium of the History of Christian Dogmas), (Stuttgart, 1847), he published various critical treatises on parts of the New Testament; such as *Die Christuspartei in der Korinthischen Gemeinde; der Gegensatz des Paulinischen und Petrinischen Christenthums; der Apostel Petrus in Rom* (1831), (The Christ-party in the Corinthian Community; the Opposition of the Pauline and Petrine Christianity; the Apostle Peter in Rome), a work in which the author endeavors to demonstrate the existence of deep-rooted differences in that sphere of primitive Christianity, in which we are accustomed to see nothing but unity and harmony. His inquiries concerning the Gnosis led him to study minutely the pastoral epistles, the result of which study was *Die sogenanten Pastoralbriefe des Apostels Paulus* (Stuttgart, 1835), (The So-called Pastoral Epistles of the Apostle Paul), in which he combats the idea that St. Paul was their author, and refers them to the 2d century. Of a similar nature is his *Paulus, der Apostel Jesu Christi* (Stuttgart, 1845), (Paul, the Apostle of Jesus Christ). His work on the Gospel of John produced a startling effect, as up to B.'s time that gospel had generally been held prior in date to the three synoptic gospels, whereas B. strove hard to show that it was of post-apostolic origin. In 1847, appeared his *Kritische Untersuchungen über die canonischen Evangelien, ihr Verhältniss zueinander, ihren Ursprung und Charakter* (Critical Inquiry Concerning the Canonical Gospels; their Relation to each other; their Origin and Character). In 1851, he published *Das Markus-evangelium nach seinem Ursprung und Charakter* (The Origin and Character of St. Mark's Gospel). B. died Dec., 1860. In these and other works of a similar nature, B. maintained that we must extend our notions of the time within which the canonical writings were composed to a period considerably post-apostolic, and which can only be determined approximately by a careful investigation of the motives which apparently actuated their authors. The chief characteristic, therefore, of the "Tübingen School," as exhibited in the works of its founder, is the union of a subjective criticism with a strong conviction of the historic reality of the New Testament writings. The most distinguished adherents of this new school of German theology are Zeller, Schwegler, Köstlin, and Hilgenfeld.

BAUTAIN, Louis-Eugene-Marie, a French philosopher and theologian, b. at Paris, Feb. 17, 1796. He studied under Cousin at the normal school. In 1816, he was appointed professor of philosophy in the college of Strasbourg, and soon distinguished himself by the influence he exerted over the earnest youth of that city, who carried their admiration even to the length of imitating his walk and dress. The religious tendencies of his character, however, not finding a satisfactory expression in philosophy, he threw himself into the arms of the church, and became a priest in 1828. After the events of 1830, he resigned his professorship, which until then he had retained; but his reputation for orthodoxy, never very strong, had been destroyed in the eyes of his bishop by his work *La Morale de l' Evangile comparée à la Morale des Philosophes*, published a few years before, and he was in consequence suspended from sacred offices for several years, but reinstated in 1841. In 1838, he was made dean of the faculty of letters at Strasbourg, and afterwards director of the college of Juilly. At a still later period, he was translated to Paris, and appointed vicar-gen. of the metropolitan diocese. In 1848, he attempted

to give a religious direction to the revolution. He was selected as one of the professors of the theological faculty of Paris, and was an extremely popular preacher. His principal works are *Philosophie-psychologie Expérimentale* (1839), *Philosophie Morale* (1842), *Philosophie du Christianisme* (1835), *La Religion et la Liberté considérées dans leurs Rapports* (1848), *La Morale de l'Evangile comparée aux divers Systèmes de Morale* (1855). He died in 1857.

BAUTZEN, or, in official language, BU'DISSIN, capital of the circle of the same name, kingdom of Saxony: It has a pop. (1875) of 14,709, including many *Wends*, remnants of the old Vandals. It is situated on a rising ground overlooking the river Spree, and is the seat of the chief offices of justice in the circle, which has a pop. (1875) of 339,203, including 50,000 Wends. It has several churches, a royal palace—formerly the residence of the markgrafs of Meissen—numerous schools, and two public libraries and hospital. The chief branches of industry are manufactures of woolens, fustian, linen, hosiery, leather, and gunpowder. B. is a place of considerable antiquity, and was known in the time of Henry I. (931), but was first made a town under Otho I. Its several privileges, and the reputation of certain holy relics preserved in St. Peter's church, made the place important. It suffered greatly in the war with the Hussites, and still more during the thirty years' war. Meissner, the poet, who died in 1805, was born here. B., however, is chiefly celebrated as the place where Napoleon, with an army of 150,000 men, after an obstinate resistance, won a barren victory over 90,000 of the allied Russians and Prussians, May 20–21, 1813. The allies lost in the two days 15,000 in killed and wounded; in addition to 1500 prisoners, mostly wounded, which the French captured. The French left 5000 dead upon the field, and upwards of 20,000 were wounded. The result of the battle, and the splendid retreat of the allies, were most disheartening to the French army, and even to Napoleon himself.

BAVA'RIA (Ger. *Baiern*, and officially, *Bayern*), one of the states of the German empire; according to its size, the second in importance. B. is divided into two unequal parts, which are separated by the Baden and Hesse-Darmstadt dominions. The eastern portion, comprising fully eleven twelfths of the whole, is situated between lat. 47° 20′, and 50° 41′ n., and long. 9° and 13° 48′ east. It is bounded n. by the Prussian province of Hesse-Nassau, the Thuringian principalities, and the kingdom of Saxony; e., by Bohemia and Austria; s., by the Tyrol; and w., by Würtemburg, Baden, and the grand duchy of Hesse. The western part, occupying the Rhine Palatinate, on the left bank of the Rhine, lies between lat. 48° 57′ and 49° 50′ n., and between 7° 5′ and 8° 27′ east. Rhenish Prussia, the grand duchy of Hesse, and Baden bound it on the w., n., and e., and France on the south.

B. is divided into eight circles, as follows:

Circles.	Area in sq. miles.	Pop. in 1875.
Upper Bavaria	6,535	894,404
Lower Bavaria	4,091	622,377
Palatinate	2,272	641,567
Upper Palatinate	3,679	503,422
Upper Franconia	2,632	555,043
Middle Franconia	2,914	607,085
Lower Franconia	3,409	597,056
Swabia and Neuburg	3,648	601,950
Total	29,180	5,022,904

At the census of 1871 the pop. was 4,863,450.

Surface, Hydrography, Railways, etc.—B. may be described as a mountainous country. It is walled in on the s.e., n.e., and n.w. by mountains ranging from 3000 ft. to close on 10,000 ft. in height. The highest elevation is reached on the s., the Zugspitz of the Noric Alps being 9665 ft. high. On the e., the highest points of the Böhmerwald, dividing B. from Böhemia, are the Arber and Rachelberg, which are respectively 4613 ft. and 4800 ft. high. On the n.e., the Schneeberg, in the Fichtelgebirge range, attains a height of 3481 feet. A branch of this chain, which is connected on the n.w. with the Thuringerwald, extends s. between the rivers Regnitz and Vils. The Rhöngebirge, the greatest height of which is 3000 ft., forms the northernmost chain of Bavaria. In the Rhine palatinate, the principal mountain is the Hardt, whose culminating peak is about 2300 ft. high. In the interior, B. is intersected in several directions by various less elevated ranges, alternating with extensive plains and fertile valleys. B. is rich in wood, nearly one third of its surface being covered with forests, mostly of pine and fir.

As to its *hydrography*, B. has the Rhine flowing along the whole eastern boundary of the circle of the palatinate, which is also watered by the Speyer, the Lauter, and the Queich. The Danube enters B. proper at Ulm, where it is joined by the Iller, and pursues its course in an e.n.e. direction through the center of the country, until it passes out at Passau into the Austrian dominions. Including its windings, the length of the Danube in B. is about 270 m., which can be navigated throughout. In its passage through B., it receives no fewer than 38 rivers, the chief of which, on the right bank,

are, besides the Iller, already mentioned, the Lech, the Isar, and the Inn; and on the left, the Wörnitz, the Altmühl, the Kocher, the Naab, the Regen, and the Ilz. The n. part of B. is in the basin of the Main, which, rising in the north, flows with many windings through the kingdom in a s.w. direction to the Rhine, with which it unites at Mayence. Its most important tributaries are the Regnitz, the Rodach, the Tauber, and the Saale. B. has several lakes, the principal of which are the Chiem, which has a circumference of 35 m.; the Wurm, with a length of 14 m., and a breadth of 4 m.; and the Ammer, with a circuit of 27 miles. These lakes are situated in the south, at the foot of the northern slope of the Noric Alps. A corner of lake Constance also belongs to Bavaria. The lakes and rivers abound in fish. There are a few canals in the country, the most important of which is the *Ludwigs-Kanal*, which, taking advantage of the rivers Main, Regnitz, and Altmühl, unites the Rhine and Danube, and, through them, the German ocean with the Black sea. This canal was executed by government at a cost of upwards of £800,000. B. has altogether about 1700 m. of railway in operation. One of the chief is that between Augsburg and Lindau on lake Constance, a distance of 80 miles. These lines join Munich with Augsburg, Donauwörth, Nürnberg, Bamberg, Ulm, Kufstein, etc. B. has about 9000 m. of public roads, and over 1500 of telegraphs.

Climate, Soil, Products, etc.—The temperature of B. varies considerabiy, being cold and bleak in the mountainous regions, and very hot in summer in the plains and valleys. The climate may be described generally, however, as mild and salubrious. The soil, particularly in the valleys of the upper and lower Danube, is very fertile, second to none in central Germany; but its capabilities as yet have not been fully developed, although even now the wealth of the country consists almost wholly of its agricultural produce. The plain s. of Munich has been described as the granary of Germany, in consequence of its great productiveness, while the circles of upper and middle Franconia are styled the hop-garden of Bavaria. Wheat, rye, oats, and barley are the chief articles of produce, but buckwheat, maize, and rice are also grown to a small extent The vine, as well as the hop-plant, is cultivated extensively in Franconia, and the wine is held in great esteem. Rhenish B. also produces good wine. The quantity annually produced in B. is estimated at upwards of 16,000,000 gallons. Fruit, tobacco, flax, hemp, linseed, licorice, and beet-root are cultivated. Cattle-rearing forms the exclusive occupation of the inhabitants on the slopes and at the foot of the Alps, pasturage being found at an elevation of 8500 feet. Sheep, goats, and pigs are reared in middle and upper Franconia, and horses chiefly in upper B. and Swabia, but the live-stock is far from being adequate to the extent and capacity of the country. The forests of B. annually furnish large quantities of timber. The soil is rich in mineral wealth, which as yet has not been drawn upon to anything like its full extent. The chief minerals are salt—which is a government monopoly, and obtained by evaporation, principally from the rich mines in the s.e. corner of the Alps—coal and iron, which is worked almost everywhere throughout the territory. In Rhenish B., copper, manganese, mercury, and cobalt are found; quicksilver and black-lead are obtained in some places; marble in great variety is common, so also are gypsum, alabaster, and some of the finest porcelain clay in Europe.

Manufactures, etc.—The manufacturing industry of B., like its agriculture, is generally in an undeveloped state, and not centered in the hands of capitalists, who can largely take advantage of new inventions to prosecute it with energy and success, but distributed among numerous small manufacturers.

This is not the case with beer, the manufacture of which is carried to great perfection in B., and to an extent, if we take population into account, quite unparalleled in Europe. There are upwards of 5000 breweries in B., making about 110,000,000 gallons of beer annually, which are mainly consumed in the country, the quantity of beer that a Bavarian can imbibe being quite marvelous. Nearly two thirds of the revenue of the state are said to be derived from this source alone. Next to beer, coarse linen is the most important product of manufacturing industry, and of late years some considerable cotton-factories have been erected; but the supply of cotton, woolen, and worsted goods is not equal to the home consumption. Leather is pretty extensively manufactured, so also are paper, articles of straw and wood, porcelain, glass, nails, needles, jewelry, beet-root sugar, and tobacco. The mathematical and optical instruments of Munich are held in high repute. The exports consist of timber, grain, wine, cattle, wool, salt, hops, fruits, beer, leather, glass, jewelry, optical and mathematical instruments, butter, cheese, etc. The annual value of these is estimated at about £1,500,000. The principal imports are sugar, coffee, woolens, silks, stuffs, drugs, hemp, and flax. The position of B. gives it the transit trade between n. Germany and Austria, Switzerland and Italy.

Population, Religion, Education.—The growth of the population of B. is much checked by the regulations which relate to marriages. No marriage can take place until the authorities who superintend the relief of the poor are fully satisfied that the persons wishing to marry have adequate means to support a wife and family; and certain military obligations have also to be fulfilled before a man can enter into wedlock. These restrictive laws have another consequence besides that of preventing a rapid increase of the population; they have tended to increase inordinately the number of illegitimate children. B. has a very bad pre-eminence in this respect on the continent. In the capital, the illegitimate births about equal the legitimate; and over the whole

kingdom the proportion ranges from 1 in 4.5 to 1 in 5 of the total births, equal to a percentage of from 22¼ to 20 illegitimate births. In 1817, the population was 3,564,757; in 1833, 4,187,390; and in 1805, it had only increased to 4,541,556. During recent years, however, the increase has been more rapid, the population in 1864 amounting to 4,807,440; and in 1871, to 4,863,450. The Bavarians, notwithstanding their beer-bibbing propensity, are essentially a sober and industrious people. Though all of German origin, they differ materially in character. The Franconians are intelligent, diligent, and steady; the Suabians, good-naturedly indolent; and the inhabitants of the Palatinate, lively and enterprising; while the Bavarians proper are dull and superstitious.

As to *religion*, in 1871, the Roman Catholics numbered 3,464,364; Protestants, 1,342,592; Jews, 50,662; and other minor sects, 5453. The state allows perfect toleration, guaranteeing the same civil rights to Catholic and Protestant alike. Individuals of every sect have the privilege of worshiping privately without fear of molestation; and on application to the king by a sufficient number of families, the right of public worship can be secured. A concordat with Rome divides the state into 2 archbishoprics and 6 bishoprics. The consistories of Anspach, Baireuth, and Speyer, under the superior consistory of Munich, govern the Lutheran church, the Munich consistory being in some degree subject to a section in the home department, which manages the temporal concerns of all the churches. The president of the Munich consistory has a seat and vote in the council of the state. The revenues of the church of Rome are derived from lands and endowments, the Protestant church is supported by the state. Of late, the Bavarian government has become conspicuous by opposing the Ultramontanes, and encouraging the "Old Catholics."

B. has a good system of *education*, under the supreme direction of a minister of public instruction, to whom certain members of the provincial governments, specially instructed to watch the educational interests of the communities, are subordinate. They, again, have numerous inspectors under them, who make systematic reports. Nevertheless, in upper and lower B., about one fifth of the children are yet without a school education. Besides elementary schools, there are about 30 *gymnasia*, and numerous Realschulen and technical schools of various kinds. The three Bavarian universities are at Munich, Würzburg, and Erlangen, the latter being Protestant. There are several extensive libraries in B., that of Munich being the largest in Germany. Art has been zealously cultivated in B., and since the days of king Louis I. has been peculiarly fostered by the state. There are numerous institutions for the furtherance of painting, sculpture, and music.

Government, Revenue, etc.—B. is a constitutional monarchy, the throne hereditary in the male line. Its constitution dates no further back than 1818, when it was declared a part of confederated Germany. The king is the executive. The legislature consists of a chamber of senators, and one of deputies. The senators are hereditary, the king, however, having the power, within certain limits, to nominate members for life. The chamber of deputies consists of five different classes—one eighth of the whole members being chosen from landed proprietors, who exercise judicial powers in right of their property, and have no seat in the upper house; another eighth from ecclesiastics of the Protestant and Roman Catholic churches; a fourth from the inhabitants of cities and market towns; and a half from landed proprietors who neither possess judicial rights, nor a seat in the other chamber. There are, besides, three members from the universities—one from each. There is one member in the chamber of deputies for every 7000 families, or 35,000 inhabitants. In the event of there not being a dissolution, the chamber lasts for six years. The usual length of the annual session is two months. The chambers, in ordinary circumstances, meet once a year for the dispatch of business, and it is compulsory on the king to summon them once in three years. No deliberation can take place unless two thirds of the deputies are present. All matters relating to public burdens, etc., come first under the consideration of the chamber of deputies; with reference to other questions, the king exercises his own discretion as to which chamber shall first discuss them. No alteration in taxation, and no new law, can be promulgated without the consent of the legislature; but the royal prerogative is loosely defined.

The cabinet consists of seven members, chiefs of the departments of foreign affairs, justice, home affairs, public worship and instruction, finance, commerce, and public works and war. They are not necessarily members of the chambers, though they are privileged to be present at the deliberations. The privy council is composed of the king, certain royal princes, the ministers of state, and six councilors nominated by the king.

The *revenue* of B. for 1876–77 amounted to 258,686,781 marks (£12,934,324), of which 20,296,453 marks were to be raised by direct taxation, 39,062,210 marks by indirect taxation, the rest chiefly from domains and state monopolies. The expenditure for the same year was estimated at the same figure. The interest on the national debt swallows up about 15 per cent of the whole expenditure; the army, 18 per cent; and worship and education about 11 per cent. In 1876, the public debt amounted to 1,108,954,854 marks (£55,447,742), 398,345,143 marks being contracted for railways. In 1858, the public debt was 122,839,495 florins, and the debt on railways was 88,643,834 florins—total, £17,623,629.

The raising of the *army* of B. was in 1871 adapted to the Prussian method of con-

scription. Every Bavarian is liable to service for seven years, and no substitution is allowed. The period of active service is four years, the remaining three being spent in the army of reserve; and the soldier, after quitting the reserve, is bound to serve other five years in the landwehr. When B., in Nov., 1870, became one of the kingdoms of the German empire, her army, on the established conditions of its formation, was formed into two corps of the imperial army, each consisting of two divisions, under the command of the king of B. in times of peace, but controlled by the emperor of Germany in war. On the peace-footing, the infantry consists of 16 regiments, 48 battalions, 26,638 men in all; besides which there are 10 battalions of chasseurs, 5510 strong, and 32 battalions of landwehr. There are 10 regiments of cavalry, of 7192 men; 5544 artillery, 1214 engineers, and 1126 of the military train—in all, 47,224 men, without including the *landwehr*. In time of war the total force is 149,892, rather more than trebled.

History.—The Boii, a race of Celtic origin, were the first inhabitants of B. of whom tradition furnishes any account. From them, its German name, Baiern, as well as its old Latin name, Boiaria, is said to have been derived. They appear to have conquered the country about 600 B.C., and they retained it until, shortly before the Christian era, when they were subjugated by the Romans; the country being made an integral part of the Roman empire, under the names of Vindelicia and Noricum. After the decay of the Roman power, the Ostrogoths and Franks successively held possession of it, until Charlemagne conquered it. After his death, it was governed by lieutenants of the Frank and German kings, until 1070, when it passed into possession of the Guelph family; and it was transferred by imperial grant, in 1180, to Otho, count of Wittelsbach, whose descendant now occupies the throne. The Rhenish Palatinate was conferred on this family by the emperor Frederick III. in 1216. Now followed quarrels between relatives, and divisions of territory, until the dukedom of B. was severed from the Rhenish and upper Palatinates (see PALATINATE); of the latter, however, it repossessed itself in 1621—the peace of Westphalia, in 1648, confirming the title of its princes to that possession, as well as its right to the electoral dignity to which it had been raised in 1624. In the war of the Spanish succession, B. supported France, and suffered considerably in consequence; but in 1777, on the extinction of the younger Wittelsbach line, it received the accession of the Rhine Palatinate. In 1805, B. was erected into a kingdom by Napoleon I. The king assisted Napoleon in his wars, and in consideration of his aid received large additions of territory. In 1813, however, the Bavarian king opportunely contrived to change sides, and thus managed to have confirmed to him, by the treaties of 1814–15, an extent of territory nearly as valuable as the possessions which the treaties of Presburg and Vienna had given him, and which he had now to restore to Austria.

In 1818, as already intimated, the new constitution came into existence, but owing to various causes, it did not secure that measure of popular freedom and contentment that had been expected. In 1825, Louis I. ascended the throne. He was a well-meaning, liberal, and intellectual monarch, and was favorable to the liberty of the people and the press; but he lavished the wealth of the kingdom to an extravagant degree on the embellishment of the capital, and on works of art, while he neglected to a considerable extent works of practical value, that would have tended to enrich the country, diminish the public burdens, and consequently increase the welfare of his people. In 1830, a wave from the French revolution swept over the country, disturbing its equanimity, but not to any serious extent. The Bavarian government, however, took alarm, and restricted the freedom of the press. These restrictions excited so much opposition, that they were soon after rescinded, but new dissatisfaction was created by the imposition of new taxes. The Jesuits now obtained an immense influence with the king, which they used to the detriment of popular rights. The wrath of the people was further aroused against their monarch by his connection with the notorious Lola Montez, who was looked upon as an agent of the Ultramontanists—an imputation which that lady, in her autobiography, published in 1858, indignantly repudiates, maintaining that she was the inveterate enemy of that party, and the true friend of the people. In March, 1848, following the example set by the French revolutionists, the people of Munich seized the arsenal, and demanded reforms and the expulsion of Lola Montez. The king had to consent; but in the same month he abdicated his throne, in accordance, says Lola Montez, with a promise made by him to her. His son, Maximilian II., ascended the throne. He died in 1864; and Louis II., a distinguished patron of Wagner, the great musician, now reigns. See GERMANY.

BAVARIA, a colossal female statue at Munich, which bears the name of the country of which it is a personification, is said to be second in size only to the famous Colossus of Rhodes. It was erected by king Louis I., the model having been executed by Schwanthaler. Externally, the figure bears a German aspect. A long folding garment reaches from the middle to the naked foot; over the half-naked breast a skin is cast, and the hair falls freely over the back. The brow is adorned with sprigs of oak; in the left hand, which is raised, she holds a wreath of oak; and in the right, which is bent towards the breast, a sword; at her side reposes the Bavarian lion, the guardian of her kingdom, in a sitting attitude. The statue is 65 ft. high, the pedestal being 30, so that the whole monument has a height of 95 feet. The statue was cast from the bronze of Turkish and Norwegian cannon. Internally, it is very remarkable. Through the back part of the

pedestal, a door leads to a stone staircase, consisting of 60 steps. The figure itself is hollow, and resembles a mine, with side-passages which lead into the lion. A staircase of cast iron, of 58 steps, leads through the neck up into the head, where there are two sofas, and several openings for the enjoyment of the view. At the highest part of the head, there is the following inscription: "This colossal figure, erected by Louis I., king of Bavaria, was designed and modeled by L. von Schwanthaler, and cast in bronze, in years 1844 to 1850, by Ferdinand Miller." The head contains standing-room for 31 persons. The whole figure consists of seven pieces, and the lion, of five. The monument was formally uncovered, amidst great rejoicings, on the 7th Aug., 1850.

BA'VINS, in the pyrotechny of warfare, are small bundles of easily ignited brush wood, from 2 to 3 ft. in length. They are made by arranging the bush-ends of the twigs all in one direction, tying the other ends with small cord, dipping the bush-ends into a kettle containing an inflammable composition, and drying them. They are employed among the combustible materials in fire-ships.

BAWBEE, or BABEE, the popular designation of a half-penny in Scotland, now dropping out of use. The origin of the term is obscure; but it is most probably a corruption of *bas billon*, Fr., applicable to debased copper money. In the plural form, the word is often popularly used in Scotland to signify money generally. In Scottish song, B. is synonymous with a girl's fortune or marriage-portion—as, *Jenny's Bawbee*.

BAWR, ALEXANDRINE SOPHIE COURY DE CHAMPGRAND, Baroness de; 1773–1861; a French novelist and dramatist, wife of Saint Simon, who got a divorce because he did not think her fit to be the wife of "the first man in the world." In 1806, she wedded baron de Bawr, who was killed by accident a few months after the marriage. Some of her plays are still occasionally acted.

BAXTER, a co. in n. Arkansas, on the Missouri border, bounded on the n. by White river; about 600 sq.m.; pop. '80, 6,004. The surface is hilly and undulating, and the soil fertile. Farming and stock-raising are the main occupations. Co. seat, Mountain Home.

BAXTER, ANDREW, 1686–1750; a Scotch philosopher, author of *An Inquiry into the Nature of the Human Soul, wherein its Immateriality is evinced from the Principles of Reason and Philosophy*. He also wrote on questions of science for the teaching of children.

BAXTER, RICHARD, one of the most eminent of the nonconformist divines, was b. Nov. 12, 1615, of poor but genteel parents, at Rowton, in Shropshire. His early education was somewhat neglected. Instead of attending, as he wished, one of the universities, he was obliged to content himself with a course of private study, in the midst of which he was induced, singularly enough, for he was habitually serious, to try his fortune at court. Hither he accordingly hied, fortified with an introduction to the master of the revels. A month sufficed to convince him that he was out of his element at Whitehall, and a protracted illness after his return helped to deepen the earnestness of his religious convictions. Soon after, at the age of 23, he was ordained, and entered on the mastership of Dudley grammar-school, from which he removed to act as assistant to a clergyman at Bridgenorth, where he resided nearly two years. In 1640, he was invited to become parish clergyman of Kidderminster, an offer which he accepted; and within a comparatively brief period, not only did he establish his reputation as one of the most remarkable preachers of the time, but what was better, succeeded in effecting a wonderful improvement in the manners of the people. On the breaking out of the civil war, his position became somewhat peculiar. Sincerely attached to monarchy, his religious sympathies were almost wholly with the Puritans; and though a Presbyterian in principle, he was far from admitting the unlawfulness of episcopacy. These views, which, some time before the restoration, became extremely popular, were now too catholic for the general taste, and the open respect shown by B. to some leading Puritans exposed him to some danger from the mob. He accordingly retired to Coventry, where he ministered for two years to the garrison and inhabitants. He afterwards accepted the office of chaplain to col. Whalley's regiment, and was even present at the sieges of Bridgewater, Exeter, Bristol, and Worcester. His influence was at all times exerted to modify the intolerance of partisanship, and to promote "the spirit of love and of a sound mind." On the urgent invitation of his parishioners, he returned to Kidderminster, when ill-health forced him to leave the army, and continued to labor there for some time. During this period, he greatly extended his fame by the publication of his *Saints' Rest* and *Call to the Unconverted*. He never dissembled his sentiments with regard to the execution of the king and the usurpation of Cromwell, even in the presence of the protector himself, who endeavored, without success, to enlarge his ideas on the subject of revolutions. On the return of Charles, B. was appointed one of his chaplains, and took a leading part in the conference held at the Savoy to attempt a reconciliation between the contending church factions, a project defeated by the bigoted obstinacy of the bishops. B. was tempted with the offer of the see of Hereford, but declined the honor, praying instead to be permitted to return to his beloved flock at Kidderminster. He asked no salary, but his request was refused. The act of uniformity at length drove him out of the English church, and in July, 1663, he retired to Acton, in Middlesex, where he spent the greater part of nine years, chiefly occupied in the composition of

some of the most important of his numerous works. These he produced with a rapidity unparalleled in modern generations, at least in this one respect, that the quality was not always in the inverse ratio of the quantity. The act of indulgence in 1672 permitted him to return to London, where he divided his time between preaching and writing. At length, in 1685, he fell into the brutal clutches of judge Jefferies, who condemned him, for alleged "sedition" in his *Paraphrase of the New Testament*, to pay a fine of 500 marks, and in default, to lie in the king's bench prison till it was paid. The circumstances of the trial are graphically described by Macaulay in the second volume of his history. After a confinement of nearly 18 months, B. was released and pardoned, on the mediation of lord Powis. He lived after this to see better times, and died on the 8th Dec., 1691, in the 75th year of his age.

B. is said to have preached more sermons, engaged in more controversies, and written more books than any other nonconformist of his age; and Dr. Isaac Barrow has said of him, that "his practical writings were never mended, and his controversial seldom confuted." The total number of his publications exceeded 160. Of these, by far the most popular and celebrated are his *Saints' Rest*, *Dying Thoughts*, and *Call to the Unconverted*—20,000 copies of which last were sold in a twelvemonth, and it was translated into all European languages. More important, however, in a theological point of view, are his *Methodus Theologiæ* and *Catholic Theology*, in which his peculiar system—a compromise between Arminius and Calvin—is embodied. His autobiographical narrative is historically valuable; the review of his religious opinions is spoken of by Coleridge as one of the most remarkable pieces of writing in religious literature. A complete edition of his works, in 25 vols., with a life by Orme, was published in 1830. His practical works, in 4 vols., were published in 1847.

BAXTERIANS is the term that was formerly applied to those who adhered to Baxter's theological system, the peculiar doctrines of which were: 1st, That though Christ died in a special sense for the elect, yet he also died in a general sense for all; 2d, The rejection of the dogma of rebrobation; 3d, That it is possible even for saints to fall away from saving grace. The tendency of Baxter's views was towards a more liberal theology, but they are deficient in logical consistency. Nevertheless, they have been, and still are, embraced by many pious people—especially among the dissenters—who shrink from accepting what they consider the hard conclusions of Calvinism, or the latitudinarian views of Arminianism. The two most eminent B. are Dr. Isaac Watts and Dr. Philip Doddridge.

BAY (from a Saxon root, "to bend") is properly applied to an indentation of the sea into the land, with an opening wider than the depth. A gulf is understood to be deeper than a bay, and has often a narrow opening. These terms are often loosely applied; Baffin's bay, e.g., is really a gulf. When the body of water is large, and the entrance narrow, it becomes a shut sea, as the Baltic, the Red sea, etc. Hudson's bay, the Persian gulf, and the gulf of Mexico might with propriety be termed seas.

BAY, a name given to a number of trees and shrubs more or less resembling the laurel or victor's laurel (*laurus nobilis*), which is also called SWEET BAY (see LAUREL); the name *baye*, which was once exclusively applied to the fruit, having been extended to the whole plant. The common laurel or cherry laurel (*prunus laurocerasus*) is sometimes called BAY LAUREL. See LAUREL.—The RED BAY of the Southern states of America is *laurus caroliniensis*. See LAUREL.—The WHITE BAY of America is *magnolia glauca* (see MAGNOLIA), and the LOBLOLLY BAY of the same country is *gordonia lasianthus*. See GORDONIA.

From early times, bay-leaves have been associated with popular superstitions and usages. Along with other evergreens, they have adorned houses and churches at Christmas; and in token of rejoicing or of some meritorious deed, sprigs of bay, as well as of laurel, have been worn in the hat, or wreathed around the head. There appears to have been a notion that the B. was an antidote against the effects of thunder. In an old play, *The White Devil*, Cornelia says:

> "Reach the bays:
> I'll tie a garland here about his head,
> 'Twill keep my boy from lightning."

According to Shakespeare, the withering of bay-trees was reckoned an omen of death. Thus Richard says:

> "'Tis thought the king is dead; we'll not stay.
> The bay-trees in our country are withered."

The following passage occurs in *Parkinson's Garden of Flowers*, 1629, p. 598: "The bay-leaves are necessary both for evil uses and for physic, both for the sick and for the sound, both for the living and the dead. It serveth to adorn the house of God, as well as man; to crowne or enriche, as with a garland, the heads of the living; and to strike and decke forth the bodies of the dead; so that from the cradle to the grave, we have still use of it, we have still need of it." For other notices of this kind respecting the B., we refer to *Brand's Popular Antiquities*, also to *Hone's Year Book*. Bay-leaves are sometimes used in cookery for the sake of flavoring.

BAY, a co. in n.e. Michigan on Saginaw bay; intersected by Saginaw river and a branch of the Michigan Central railroad; 750 sq.m.; pop. '74, 24,832. There is little of agriculture, lumber being the main article of trade. Co. seat, Bay City.

BA'YA, *Ploceus Philippinus*, a small East Indian bird, of the great family of the *fringillidæ* (q.v.), and of a genus to some of which, from their remarkable manner of constructing their nests, the name weaver bird (q.v.) is often given. It is described by the older ornithologists under the name of the Philippine grossbeak, or *loxia Philippina*. It is yellow, spotted with brown, the throat black, the beak conical and large. Its nest is very curious. Suspended from a slender twig of a lofty branch, so that monkeys, squirrels, and serpents may not reach it, it is rendered still more secure by its form, which is very like that of a common Florence flask, the entrance, however, being from beneath, and not from above, with lateral openings to separate chambers, in one of which the female sits upon the eggs, whilst another is occupied by the male, who there pours forth his song. It is composed of fine fibers of leaves and grass. The B. is very easily tamed, will perch on the hand, and can be trained to fetch and carry at command.

BAYADE'RES (from the Portuguese *bailadeira*, that is, dancing-girl) is the name given by Europeans to the dancing-girls and singers in India, who are divided into two great classes, each comprising many subdivisions. The first of these classes, who are called Devadasi—that is, slaves to the gods—are divided into two distinct grades, according to the rank of the families whence they have sprung, the dignity of the idol to which they are devoted, and the authority and riches of the temple to which they belong. Those of the first rank are chosen from the most influential families of the Vaisya caste, to which the rich landed proprietors and merchants belong. Those of the second class are chosen from the chief Sudra families, who correspond to our mechanics. No girls can be admitted among the Devadasis but such as are still in childhood, and free from any bodily defect. The parents of the girl must renounce by a solemn agreement all right to their child, who then receives the necessary instruction. The employment of the Devadasis is to sing the praises of their god at festivals and solemn processions, to celebrate his victories and great deeds, and to dance before him, to weave the wreaths with which the images are adorned, and in general to perform subordinate offices in the temple and for the priests. On the other hand, they are excluded from the celebration of such rites and ceremonies as are accounted peculiarly sacred, as, for example, at sacrifices for the dead, suttis, etc. The Devadasis of the first rank live within the inclosure of the temple, which they are not permitted to leave without the special permission of the high priest. They must remain unmarried for life, but are, notwithstanding, permitted to choose a lover, either in or out of the temple, provided he belongs to one of the high castes. A connection with a man of low rank would be punished with the utmost severity. If they have children, the girls are brought up to their mother's profession, and the boys are educated for musicians. The Devadasis of the second rank differ but little from those of the first, but they have more freedom, as they live without the temple. A certain number of them must attend daily at the temple service, but at public processions they are all obliged to appear. They not only dance and sing before the images—for which they receive a fixed allowance of rice-money—but when summoned by the nobles, they perform at marriages, banquets, etc. All the Devadasis reverence, as their special patroness and protectress, the goddess Rambha, one of the most beautiful dancers in the paradise of Indra. They bring a yearly offering in spring to her and to the god of love. The singing-girls who travel about the country are of an essentially different class from the Devadasis. They perform only at private feasts, entertain strangers in the *tschultris*, or public inns, and get different names according to the special arts in which they excel. Some of them live independently in bands, consisting of from 10 to 12 persons. They travel about the country, and divide their gains with the musicians who accompany them. Others are under the authority of *dayas*, or old dancing-women, who receive all the money they gain, and give the girls only enough for food and clothing. Some are really the slaves of such old women, who have procured them in their infancy either by purchase or by capture, and have instructed them in their art. To one of these classes belonged those B. who visited several of the European capitals in 1839. The costume of the B. is not without a certain alluring charm. Their dances do not resemble what we are accustomed to call dancing, but are rather a species of pantomime, which is explained by the songs recited by the accompanying musicians. The themes of these songs are usually either happy or despairing love, jealousy, etc. Europeans have spoken with much enthusiasm of the charms of these pantomimes; but to judge by the performances of the above-mentioned B. during their visit to Europe, these descriptions must be looked upon as very much exaggerated; for although these dancers possessed great physical agility, their movements were wanting in dignity and grace.

BAYA'MO, or SAN SALVADOR, a t. in the eastern part of the island of Cuba, 60 m. n.w. from Santiago. It is situated in an unhealthy plain, near the left bank of the Canto, a small river which falls into an arm of the sea called the canal of Bayamo. The town carries on a considerable trade. Pop. about 7500.

BAYARD, JAMES ASHETON, 1767–1815; b. Philadelphia; a descendant of Nicholas B., a French Huguenot; educated at Princeton; began law practice in Delaware; was

elected to congress; declined the mission to France; was chosen U. S. senator in 1804; was one of the commissioners of the United States at Ghent to negotiate for peace with Great Britain in 1814; afterwards offered the mission to Russia, but refused it.

BAYARD, JAMES ASHETON, son of the first James Asheton; U. S. senator from Delaware for two terms, resigning in 1869. He was an eminent lawyer, and for years chairman of the senate judiciary committee.

BAYARD, JEAN FRANÇOIS ALFRED, 1796–1853; a French dramatist, working with Dumanoir, Scribe, and others, and husband of Scribe's niece. He was the author of more than 200 plays.

BAYARD, PIERRE DU TERRAIL, Chevalier, the knight *sans peur et sans reproche*, b. 1476, at Castle Bayard, near Grenoble, was perhaps the only hero of the middle ages who deserved the unmingled praise and admiration bestowed upon him. Simple, modest, a sterling friend and tender lover, pious, humane, and magnanimous, he held together in rare symmetrical union the whole circle of the virtues. After acting as page to the duke of Savoy, Bayard entered the service of Charles VIII., whom he accompanied to Italy, and gained renown in the battle of Verona, where he took a standard from the enemy. At the beginning of the reign of Louis XII., Bayard was engaged in a battle near Milan, where he followed the defeated and retreating forces with such impetuosity that he entered the city with them, and was made a prisoner, but the duke Ludovico Sforza released him without ransom. At Barletta, in 1502, Bayard, with ten other French cavaliers, fought a tournament with an equal number of Spaniards, in order to decide their respective claims to superiority; and although seven Frenchmen were overthrown in the first charge, the result, chiefly through Bayard's bravery, after a six hours' combat, was declared equal. Next, we find him fighting bravely in Spain, and against the Genoese and Venetians. When pope Julius II. declared war against France, Bayard hastened to support the duke of Ferrara; but failed in his scheme for making the pope a prisoner. Subsequently, he won fresh laurels in Spain. In the war with Henry VIII. of England—who had threatened Picardy, and besieged Terouane, in 1513—when the French, on one occasion, were about to lay down their arms, Bayard made a sudden attack on an English officer, and, pointing his sword at his breast, said: "surrender, or I take your life." The Englishman gave his sword to Bayard, who returned his own, saying: "I am Bayard, your prisoner; and you are mine." The emperor and the king of England exchanged their prisoners without any demand of ransom for Bayard. When Francis I. had ascended the throne, Bayard was sent into Dauphiné to make a way for the army over the Alps and through Piedmont. In this expedition, he made Prosper Colonna a prisoner. Next, Bayard gained, at Marignano, a victory for the king, who, in consequence, submitted to receive the honor of knighthood from Bayard. When Charles V. broke into Champagne, at the head of a large army, Bayard defended Mezieres against all assaults, and on his entry into Paris, he was hailed as the saviour of his country, was made knight of the order of St. Michael, and appointed over a company of 100 men, led in his own name, an honor which until then had been confined to princes of the blood-royal. He was slain by an arrow from an arquebuss, while crossing the Sesia, April 30, 1524. So highly was he esteemed for all noble qualities, that his death was lamented not only by the French king and nation, but also by his enemies. His love of virtue, especially of that kingliest of virtues, *justice*, was so passionate, that he was wont to declare that all empires, kingdoms, and provinces where justice did not rule, were mere forests filled with brigands. His body was taken by the enemy, but was restored to France, and interred in the church of the Minorites' monastery, near Grenoble.

BAYARD, RICHARD BASSETT, 1796–1868, b. Del.; son of the first James Asheton. He was U. S. senator from Delaware from 1836–39, and from 1841–45.

BAYARD, THOMAS FRANCIS, b. Del., 1828; son of the second James Asheton; succeeded his father as U. S. senator in 1869.

BAYAZID', or BAYEZEED', a t. of Turkish Armenia, in the pashalic of Erzeroum, from which place it is distant e.s.e. about 150 miles. It is situated about 15 m. to the s.w. of the foot of Mt. Ararat; is fortified; and has a pop. of about 5000, mostly Kurds. Prior to 1830, its pop. was estimated at upwards of 15,000, and it had a brisk trade; but since that time, on account of Russian interference, its commerce and inhabitants have gradually decreased. B. has repeatedly been the scene of conflict. The Berlin congress of 1878 restored B. to Turkey, though it had been ceded to Russia by the preliminary treaty.

BAYAZID' I. See BAJAZET.

BAY'BERRY. See CANDLEBERRY.

BAY CITY, seat of justice of Bay co., Mich., on Saginaw river, near its junction with the bay of that name; on the Jackson, Lansing and Saginaw railroad, and the terminus of the Detroit and Bay city, and East Saginaw roads; pop. '74, 13,690; in '80, 38,088. It is growing rapidly and has an important trade in timber, salt, and fish.

BAYER, JOHANN, a German constructor of charts of the stars, was born either at Augsburg or at Rhain, in Bavaria, in the latter part of the 16th c., and fulfilled the

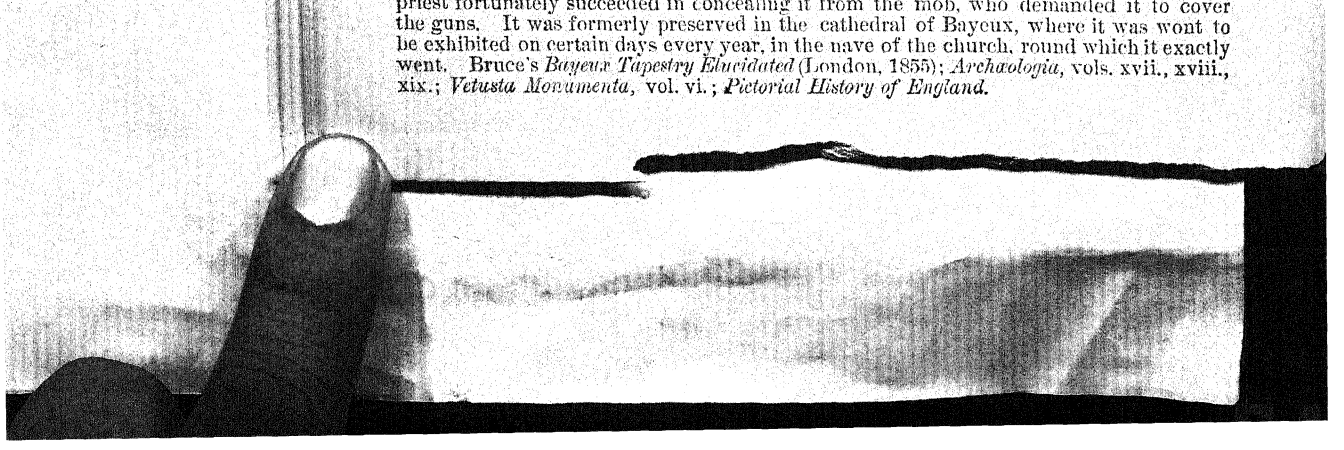
duties of a Protestant pastor in several places. His zeal for the Protestant church was so conspicuous, that he obtained the cognomen *Os Protestantium* (the Mouth of Protestants); other accounts state that he was an advocate at Augsburg. It matters little which, as he is now remembered only on account of his *Uranometria* (1603, and 2d ed. 1639), in which he gave 51 maps of the heavens, constructed from the observations of his predecessors, and followed by explanations in his *Explicatio Caracterum Æneis Tabulis Insculptorum* (Stras. 1624). Although his maps are not remarkable for accuracy, even for his time, he has the merit of introducing the simple plan of distinguishing the stars of a constellation by means of letters. The largest star of the constellation he named by the first letter of the Greek alphabet (α), and the rest in the order of their apparent brilliancy, by the following letters. This convenient plan is still followed.

BAYEUX, a city of Normandy, in France, dep. Calvados, situated on the Aure, not far from its mouth. Pop. '76, 8315. B. is chiefly built of wood and plaster, is famous for its porcelain, and has also manufactories of lace, linen, calicoes, leather, and hats. It is a town of great antiquity—its cathedral being said to be the oldest in Normandy. In it was preserved for centuries the famous Bayeux tapestry (q.v.), now in the public library of the place. B. is the seat of a bishop, and has a college.

BAYEUX TAPESTRY, a web of canvas or linen cloth, 214 ft. long by 20 in. wide, preserved in the public library, Bayeux, upon which is embroidered, in woolen thread of various colors, a representation of the invasion and conquest of England by the Normans. Tradition asserts it to be the work of Matilda, wife of William the Conqueror, and it is believed that if she did not actually stitch the whole of it with her own hand, she at least took part in it, and directed the execution of it by her maids; and afterwards presented it to the cathedral of Bayeux, as a token of her appreciation of the effective assistance which its bishop, Odo, rendered to her husband at the battle of Hastings. Some antiquaries contend that it was the work not of queen Matilda (the wife of the conqueror), who died in 1083, but of the empress Matilda (the daughter of king Henry I.), who died in 1167. According to Mr. Bruce, the latest authority on the subject, the tapestry contains, besides the figures of 505 quadrupeds, birds, sphinxes, etc., "the figures of 623 men, 202 horses, 55 dogs, 37 buildings, 41 ships and boats, and 49 trees—in all, 1512 figures." The tapestry is divided into 72 distinct compartments, each representing one particular historical occurrence, and bearing an explanatory Latin inscription. A tree is usually chosen to divide the principal events from each other. This pictorial history—for so it may be called, and indeed, in several particulars, it is more minute than any written history we have—opens with Harold prior to his departure for Normandy, taking leave of Edward the confessor. Harold is next observed, accompanied by his attendants, riding to Bosham with his hawk and hounds; and he is afterwards seen, successively, embarking from the Sussex coast; anchoring in France, and being made prisoner by Guy, earl of Ponthieu; redeemed by William, duke of Normandy, and meeting with him at his court; assisting him against Conan, earl of Bretagne; swearing on the sacred relics never to interfere with William's succession to the Saxon throne, etc.; and finally re-embarking for England. The tapestry then represents Harold narrating the events of his journey to Edward the confessor, whose death and funeral obsequies we next see. Harold then receives the crown from the Saxon people, and ascends the throne; and next we have the news brought to William, who takes counsel with his half-brother, Odo, bishop of Bayeux, as to the invasion of England. Then follow representations of the active war-preparations of the Normans; their embarkation; disembarkation; march to Hastings, and formation of a camp there; the battle and death of Harold, with which the tapestry finishes.

The B. T. gives an exact and minute portraiture of the manners and customs of the times; and it has been remarked that the arms and habits of the Normans are identical with those of the Danes, as they appear in the miniature paintings of a manuscript of the time of king Cnut, preserved in the British museum.

M. Lancelot appears to have been the first to direct attention to the existence of this curious monument, by a description of an illuminated drawing of a portion of it he had discovered, in a paper presented to the academy of inscriptions and belles-lettres, in 1724. This led to the discovery of the tapestry itself, in the Bayeux cathedral, by père Montfaucon, who published an engraving of it in 1730, with a commentary on the Latin inscriptions. In 1767, Dr. Ducarel gave an account of it in his *Anglo-Norman Antiquities.* From that time until 1803, when Napoleon had it conveyed to Paris, the B. T. excited little attention. Its exhibition, however, in the national museum there awakened public curiosity concerning it, and gave rise to various speculations as to its age, intention, etc. The discussion satisfactorily established it to be what tradition asserted it—a contemporary pictorial record of the events of the Norman conquest. The society of antiquaries (London) published an engraving of the whole in the 6th volume of the *Vetusta Monumenta.* The B. T. would have been destroyed at the revolution, had not a priest fortunately succeeded in concealing it from the mob, who demanded it to cover the guns. It was formerly preserved in the cathedral of Bayeux, where it was wont to be exhibited on certain days every year, in the nave of the church, round which it exactly went. Bruce's *Bayeux Tapestry Elucidated* (London, 1855); *Archæologia,* vols. xvii., xviii., xix.; *Vetusta Monumenta,* vol. vi.; *Pictorial History of England.*



BAYFIELD (formerly La Pointe), a co. in n.e. Wisconsin, on lake Superior, including several islands; 1450 sq.m.; pop. '74, 1032; in '80, 680, or, with Indians counted, about 1100. The surface is uneven, and in great part covered with forests. Co. seat, Bayfield.

BAY ISLANDS, a small group in the bay of Honduras, about 150 m. to the s.e. of Balize, embracing only 25′ of lat., and 1° 15′ of long. The cluster was proclaimed a British colony in 1852. The chief island is Ruatan (q.v.); and the others of any consequence are Bonacca, Utila, Burburet, Helena, and Morat.

BAYLE, Pierre, one of the most independent thinkers in the 17th c., was b. in 1647 at Carlat, in the old co. of Foix, France, and studied philosophy under the Jesuits at Toulouse. The arguments of his tutors, but especially his friendly intercourse and quiet disputation with a Catholic clergyman, who lived in his neighborhood, led him to doubt the orthodoxy of Protestantism, and shortly prevailed so far that he openly renounced his father's creed, and adopted the Catholic one. In the course of about 17 months, however, the conversation of his relatives brought him back to the Protestant profession. To escape ecclesiastical censure, he now went to Geneva, and thence to Coppet, where he studied the philosophy of Descartes. After a few years, he returned to France, and in 1675 was elected to fill the chair of philosophy in the university of Sedan. In this office he remained until 1681, when the university was disfranchised. His next appointment was that of professor of philosophy at Rotterdam. The appearance of a comet in 1680 having given occasion to a widely spread alarm, B., in 1682, published his *Pensées Diverses sur la Comète*, a work full of learning, and treating, in discursive style, many topics of metaphysics, ethics, theology, history, and politics. This was followed by his *Critique Générale de "l'Histoire du Calvinisme de Maimbourg."* In 1684, he commenced a periodical, *Nouvelles de la République des Lettres*. The religious persecutions in France gave B. occasion to write his *Commentaire Philosophique sur ces Paroles de l'Evangile: "Contrains les d'entrer,"* which professed itself to be a translation from the English, and contained a strong defense of the principle of toleration. In consequence of the accusations brought forward by the theologian, Jurieu, who regarded B. as an agent of France, and the enemy of Protestants, B., though he skillfully defended himself, was deprived of his license to teach (in 1693). He now assiduously devoted his leisure to the *Dictionnaire Historique et Critique* (1st edition, 2 vols., Rotterd. 1696—last edition, 16 vols., Paris, 1820). This was the first work published under his own name. Again Jurieu came forward as B.'s adversary, and induced the consistory of Rotterdam to censure the dictionary, chiefly on account of the supposed irreligious tendency of the article on "David," and the commendation bestowed on the moral character of certain atheists. B. promised to expunge all the objectionable matter; but afterwards, when he found that the public entertained a different and more favorable opinion of the peculiar passages than the Rotterdam consistory, he judged it best to allow them to remain as they were, or made only slight alterations. New opponents were called into the arena by his *Réponse aux Questions d'un Provincial*, and the continuation of his *Pensées sur la Comète*. Jacquelot and Leclerc now attacked his religious opinions, while others persecuted him as the enemy of Protestantism and of his adopted country, Holland. These literary and theological controversies had a bad effect on his failing health, and a disease, for which he refused to employ medical aid, proved fatal. He died Dec. 28, 1706.

B. stands at the head of modern sceptics and logicians. Accustomed to view every question scrupulously on all sides, he was apparently led to doubt on religious matters generally; at least, it is not to be denied that his scepticism carried him the length of doubting the worth or the wisdom of the religious dogmatism that ruled both Catholics and Protestants in his day. B. was thus the antithesis of a bigot, but his hostility to bigotry rather originated in his indifference to the doctrines about which theologians quarreled, than in any clear or high perception of the iniquity of religious persecution. With great eloquence and persistency, he vindicated the doctrine that moral characteristics and convictions may exist and flourish independently of particular religious opinions; and considering the barbarous manner in which the rival churches in B.'s time sought to enforce conformity of sentiment, and crush the liberty of private judgment, it is not to be wondered at that this doctrine, however objectionable abstractly, should have found a wide acceptance in Europe. Voltaire calls him "a more admirable logician than a profound philosopher;" and adds that "he knew almost nothing of physics." This probably means no more than that he was ignorant of the then recent discoveries of Newton; for the scientific articles in the dictionary presuppose a knowledge of the theories of Descartes (q.v.), with which he was conversant enough. The style of B. is clear and natural, but diffuse, and often impure. The articles in the dictionary seem to have been chosen merely as vehicles to introduce numerous digressions in notes, many of which are prolix and uninteresting; but the greater number of the articles are characterized by good sense, logic, critical acumen, and great learning. Though it is impossible to detect the presence of a religious or a philosophical system in the work, it everywhere gives indications of the high intelligence, honest principle, and universal knowledge of the author. It was proscribed both in France and Holland, and was consequently very widely diffused in both countries, and has exercised an immense influence over the literature and philosophy of the continent. It was the dawn of scepticism in the 18th

c., and may be historically regarded as the protest of the enlightened human intellect against the irrational dogmatism of the churches. In his personal character, B. was amiable, obliging, disinterested, and modest, but at the same time morally courageous and independent. His *Œuvres Diverses* were published in four volumes at the Hague, 1725–31. See life of B. by Des Maizeaux (Amsterdam, 1712), and by Feuerbach (1838).

BAYLEN', a t. in the province of Jaen (Andalusia), Spain, situated 22 m. n.n.e. of Jaen. It has manufactures of linen, glass, bricks, tiles, soap, etc. Pop. 8000. B. is celebrated as the place where the Spaniards won their first and only victory over the French in July, 1808, and that more by accident, and the errors of the French commander, Dupont, than by good generalship on their part. About 18,000 French soldiers laid down their arms at B., the only condition being, that they should be sent to France; and other detachments of French troops afterwards offered their submission. The Spaniards, however, basely broke faith with them, and sent them to the hulks at Cadiz. The capitulation had the worst effect on the French arms. Joseph Bonaparte at once fled from Madrid, and Napoleon could find no words strong enough to express his indignation at the folly and pusillanimity of the surrender.

BAYLEY, James Roosevelt, d.d., 1814–77; b. N. Y.; a graduate of Washington (now Trinity) college, Hartford; ordained minister of the Protestant Episcopal church, and preached in New York and Maryland; went over to the Roman Catholic church, and was ordained by bishop Hughes in Mar., 1842; was professor of belles lettres at St. John's college, Fordham, N. Y., and president thereof. From 1846 to 1853 he was secretary to archbishop Hughes, and in the latter year was consecrated bishop of Newark, N. J. He founded Seton Hall college, and many schools and other institutions. In 1872, he was made archbishop of Baltimore. He published a history of the Roman Catholic church in New York, *Pastorals for the People*, etc. He was much esteemed for his social as well as his intellectual gifts.

BAYLEY, Richard, 1745–1841; b. Conn.; became a physician; studied in London hospitals; practiced in New York in 1772; went to Europe in 1775, and the next spring returned as staff-surgeon to sir Guy Carleton. He lectured on surgery, and published a work on croup; was professor of anatomy and surgery in Columbia college; first health officer of the port of New York; wrote on yellow-fever, which he did not believe was contagious, and finally died of ship-fever taken while on duty as health officer. His sister, Mrs. Seton, who with his son (afterwards bishop B.) became Roman Catholic, founded the order of sisters of charity in this country.

BAYLOR, a co. in n.w. Texas; 900 sq.m.; thus far unsettled. It has a mountainous surface, with rich bottom lands.

BAYLY, Lewis, d. 1632; b. in Wales; educated at Oxford; in 1616, made bishop of Bangor. He was the author of *The Practice of Piety*, the most popular religious book until Bunyan's work appeared. His son, Thomas, became a conspicuous Roman Catholic, and published, among other works, *The End of Controversy*.

BAYLY, Thomas Haynes, 1797–1839; an English poet. He was intended for holy orders, and educated at Oxford; inherited a large fortune, but lost it, and in 1831 began to write songs for music, and, with Henry Bishop, published *Melodies of Various Nations*. Within a few years he wrote 36 pieces for representation, a number of stories, and hundreds of songs. Some of the more popular were *The Soldier's Tear; Why Don't the Men Propose? We Met, 'twas in a Crowd; I'd be a Butterfly*, etc. His larger works were *Alymers, Kindness in Women, Weeds of Witchery*, etc. Two volumes were published after his death.

BAYNE, Peter, b. 1829; a Scotch author; educated in Marischal college, Aberdeen; studied theology at Edinburgh, and philosophy under sir William Hamilton. He wrote criticisms on Alison, De Quincey, Hugh Miller, and others. In 1855, he published *The Christian Life, Social and Individual; Essays in Biography and Criticism*. He was editor of the Glasgow *Commonwealth*, traveled and studied in Germany, and married the daughter of a Prussian general. His more recent works are a defense of Hugh Miller's *Testimony of the Rocks*, *Testimony of Christ and Christianity*, and *The Days of Jezebel*, a historical drama.

BAY OF ISLANDS, near the northern extremity of New Ulster, the more northerly of the New Zealand isles. Lat. 35° 14′ s., long. 174° 11′ east. On its coasts, which are pretty nearly the antipodes of the Straits of Gibraltar, are the British settlements of Russell and Kororarika.

BAYONET, supposed to be named from Bayonne, as the place of its invention, is a dagger or small spear fixed at the end of a musket or similar weapon. The first bayonets, used in France in 1671, called *bayonets-à-manche*, had handles which fitted into the muzzle of the guns; but at a later date were introduced the *bayonets-à-douille*, or socket-bayonets, having a socket which enabled the B. so to be used as not to interrupt the firing. The use of pikes went out when that of bayonets came in. It seems very probable that the first B. was a dagger, which the musketeer stuck by means of its handle into the muzzle of his weapon, to shield him from a cavalry charge; and that the usefulness of the contrivance suggested a permanent arrangement. Bayonets are

now made with great rapidity at the government rifle factory at Enfield. Two pieces of metal are first selected—viz., a piece of the very best cast steel, 7 in. long by $\frac{3}{4}$ in. square; and a piece of the best wrought-iron rod, 4 in. long by about 1 in. in thickness. The steel is to form the blade, and the iron the socket-handle. The steel being properly shaped at one end, is joined to the iron by welding. A forging-machine is next employed to give a rough outline of the required shape. Then comes the action of a swaging-machine, with dies which come down upon the metal in great force and counter-dies beneath the metal. The metal is then annealed; turned in a cutting-machine to remove a wire-edge thrown up in the act of stamping; cut to a proper length, and the socket-end made square; drilled and bored, to make the socket hollow; shaped and furrowed along the blade; bent at the neck; hardened and tempered; and finished by a numerous train of minor operations. The Bayonet charge is now one of the most terrible maneuvers of trained infantry, in which each nation fancies itself to excel all others.

BAYONNE, one of the most strongly fortified towns of France, in the department of the Basses-Pyrénées, situated at the confluence of the Adour and Nive, about 3 m. from the mouth of their united waters in the bay of Biscay. These rivers divide the town into three parts—Great and Little Bayonne, and the suburb of St. Esprit. Pop. in 1876, 22,307. B. is beautifully situated at the foot of the Pyrénées, and is itself a handsome place. It has extensive ship-yards, rope-walks, glass-manufactories, sugar-refineries, and distilleries, and a brisk export trade in hams, for which it is famous, chocolate, liqueurs, timber, tar, and cork. Its chief imports are wool, olive-oil, and liquorice. It is the see of a bishop, has a cathedral, a mint, and schools of commerce and navigation. B. is also historically interesting. It is said that here Catharine de' Medici and the duke of Alba planned the massacre of the Huguenots, which took place on St. Bartholomew's day, 1572. Here the great Napoleon cozened Charles IV. out of the crown of Spain, after he had ineffectually endeavored to get Ferdinand VIII., to whom Charles had previously resigned it, to give it up. The forcing of the passage of the Nive, immediately in this vicinity, by the British, in Dec. 1813, occasioned some of the most bloody conflicts of the Peninsular campaign. The place was invested by the British early in the following year, and a sally from it by the French, in April 14, was only repulsed after great loss on the side of the British. B. is also famous as the place where the bayonet was invented about the year 1670.

BAYOU, a stream not fed with springs, but running from one body of water to another, like a canal. Tidal channels in the states on the gulf of Mexico often have the name.

BAYOU SARA, a village in Louisiana, parish of W. Feliciana, 165 m. above New Orleans, on the Mississippi; an important point for shipping cotton.

BAYRHOFFER, KARL THEODOR, b. 1812; German philosopher and politician; professor of philosophy in the university of Marburg. He was prominent in the revolutionary movement of 1848, a member of the diet of Hesse-Cassel, and for a time president of the chamber. After the defeat of his party (the democratic) he migrated to America.

BAY-SALT is a name applied to common salt which is obtained from sea-water by solar evaporation. It is extensively obtained from *salt-marshes* which exist along the coasts of France and on the shores of the Mediterranean. See SALT.

BAY-WINDOW, or (corruptly) BOW-WINDOW, a window peculiar to Gothic architecture, so called because it forms a *bay* or projecting space outwards from a room. The external walls of bay-windows are, for the most part, either rectangular or polygonal, the semicircular form from which the term *bow* was probably derived having been unknown previously to the introduction of the debased Gothic. Though mentioned by Chaucer, bay-windows are not found in any of the styles before the perpendicular, during the prevalence of which they were frequently introduced, particularly in halls. Bay-windows generally reach to the floor, and are frequently supplied with a seat, which is called the *bay-stall*. There are many very beautiful examples of bay-windows in the colleges and halls of Oxford and Cambridge. When used in upper stories, such windows are supported on corbels, or large projecting moldings. See ORIEL.

BAZA (the *Basti* of the Romans), a t. of Spain, in the province of Granada, and about 50 m. e.n.e. of the city of that name. It lies in a rich plain, is generally ill built and irregular, with no feature of architectural interest. Pop. about 11,000, who are chiefly engaged in agricultural pursuits.

BAZAINE, FRANÇOIS ACHILLE, a marshal of France, b. 13th Feb., 1811. Entering the army in 1831, he served with distinction in Algeria, in Spain, in the Crimea, and in the Italian campaign of 1859. He took part in the French expedition to Mexico in 1862, and from 1863 till the end of the war held supreme command of the French forces. When in Africa in 1836 he had gained the cross of the legion of honor; in 1856, he had been promoted to be commander of the legion; in 1863, he received the grand cross; and in 1869, he was made commander-in-chief of the imperial guard. At the outbreak of the great war with Germany, Bazaine was at the head of the 3d army corps near Metz. After the battles of Wörth and Forbach he took command of the main French armies, and on

Aug. 14, 1870, began a retreat from Metz. Defeated at Mars-la-Tour and Gravelotte, he retired within the fortifications of Metz, which was immediately invested by prince Frederick Charles. Attempts to escape failing, Bazaine capitulated Oct. 27; when 3 marshals, over 6000 officers, and 173,000 men laid down their arms and became prisoners of war. In 1873, Bazaine was tried by a court-martial, and sentenced to degradation and death for having failed to do his duty. The sentence was commuted to 20 years' imprisonment. But in 1874, Bazaine contrived to escape from the fortress on the Ile Ste. Marguerite, on the s. coast, where he was then confined, and ultimately made his way to Madrid.

BAZALGETTE, Joseph William, b. 1819; an English civil engineer (of French descent) who executed the great drainage works of London, and planned others at home and abroad. He was also one of the engineers of the Thames embankment.

BAZANCOURT, César de, Baron, 1810–65; a French author; director of the library at Compiègne, and author of *History of Sicily under Norman Domination*. He was the official historian of the Crimean and Italian campaigns; wrote an account of the French expeditions to China and Cochin China, and a work on fencing.

BAZAR', or Bazaar', an oriental market-place, either open or covered, where various articles, including slaves, are exposed for sale, and where eastern merchants meet for transaction of business, as on 'Change or at the Bourse in England and France. In European cities, handsome establishments, especially for the sale of fancy goods, are now often styled bazars.

BAZARD, Amand, a French socialist, was b. at Paris, 19th Sept., 1791. After the restoration he helped to found the revolutionary society of the "Friends of Virtue;" and in 1820, an association of French carbonari (q.v.), which soon had 200,000 members. He was the leading conspirator in the "plot of Befort." After some time, Bazard, impressed with the necessity of a total reconstruction of society, attached himself to the school of St. Simon. In 1825, he became one of the editors of a St. Simonian journal, termed *Le Producteur*. In 1828, he delivered at Paris a series of prelections on his politico-religious creed, which met with extraordinary success. His socialistic views were afterwards published in the *chef-d'œuvre* of the sect, *Exposition of the Doctrine of St. Simon* (1828–30), of which only the first part was by Bazard, the second, containing the principles of the new social religion, being the composition of Enfantin. After the July revolution, a larger scope was afforded to the St. Simonians. The masses were attracted by the flattering doctrine, that "all social institutions ought to have for their end the moral, intellectual, and physical amelioration of the poor." In a short time, Bazard and his coadjutors had "created a new society, living in the midst of the old," with peculiar laws, manners, and doctrines. But Bazard's connection with it was of short duration. He differed from Enfantin on the doctrine of a "community of wives," and in Nov., 1831, seceded in disgust. His efforts to found a school of his own proved unsuccessful, and during a heated discussion with his former friend Enfantin, he was struck with apoplexy, from the effects of which he never recovered. He died at Courtry, near Montfermeil, on the 29th July, 1832.

BAZIN, Antoine Pierre Ernest, b. 1807; a French physician and professor of dermatology. His works relate chiefly to syphilis, and diseases of the skin.

BAZIN, Antoine Pierre Louis, brother of A. P. Ernest, a French professor of Chinese, translator from that language, and author of a Chinese grammar.

BAZOCHE, or Basoche, a kind of burlesque translation into French of the Latin word *basilica*, i.e., royal palace. When the French parliament ceased to be the grand council of the king, and confined itself exclusively to administering justice, a distinction of name necessarily sprang up between those noblemen who formed the royal train and the *habitués* of the court of justice. The former were called *courtiers;* the latter, *basochians*, or parliamentary clerks. But inasmuch as the word *basilica* necessarily presupposed a king, the *basochians*, to keep up their dignity, gathered round a mock one of their own making, who resided at the Château des Tournelles or the hôtel St. Pol, just as the courtiers did round the reality at the Louvre. Such was the origin of the basochian king and kingdom. Their historical existence can be traced to the beginning of the 14th c., when Philip the fair conferred on the brotherhood certain privileges. The principal authorities in this harmless monarchy, after the sovereign himself, were the chancellor, the masters of requests, the referendary, and the attorney-general. Henry III. suppressed the title of king, and conferred all the privileges and rights attached to that office on the chancellor. Still the B. continued to exist as a kingdom, minus its head, and affected on all occasions the language of royalty. Its jurisdiction included the consideration and decision of all processes and debates that arose among the clerks. It administered justice twice a week, and also caused a species of coin to be struck which had currency among its members; but if we are to judge from the proverb about *la monnaie de basoche*, it did not enjoy an immense credit in the outer world of hard cash. The mock-monarch also possessed the extensive privilege of selecting at his pleasure, yearly, from the French royal forests, a tall tree, which his subjects, the clerks, were in the habit of planting, on the 1st of May, before the grand court of the palace, to the sound of tam-

bourines and trumpets. But this was not all. In the public sports, this fantastical little kingdom was worthily honored; its chancellor had rooms at the hôtel de Bourgogne; at the carnival, the *basochians* joined themselves to the corps of the prince of fools, and to the performers of low farces and "mysteries." They acted in their turn a species of satirical "morality" (q.v.), in which they made extensive use of the liberty granted to them, in ridiculing vices and the favorites of fortune. Of course, they could not fail to provoke enmity and occasion serious scandal. Louis XII. patronized these amusements. In 1500, he gave the brotherhood of the B. permission to perform plays in the grand saloon of the royal palace. Francis I. witnessed them in 1538; but in 1540, they were interdicted as incorrigible. This interdict only applied to those of Paris, for several years after, we read of the basochian farces of Bordeaux. In their later development, they seem to have resembled the *fastnachtspiele* (Shrove-Tuesday plays), so popular in Germany both before and after the reformation. They were the beginning of French comedy.

BDELLIUM, a gum-resin, resembling myrrh (q.v.) in appearance and qualities, but weaker, and at the same time more acrid. High medicinal virtues were ascribed to it by the ancients, but it is now little used. It is supposed to be the produce of *balsamodendron Roxburghii* in India, and of *B. Africanum* (also called *hendelotia Africana*) in Senegal—trees or shrubs belonging to the natural order *amyridaceæ* (q.v.), so remarkable for the number of similar substances which it produces.—EGYPTIAN B., however, is obtained from the doom (q.v.) palm, *hyphæne Thebaica*. A similar substance is yielded also by *ezradia furcata*, a half-succulent plant of the natural order *compositæ*, inhabiting the most sterile regions of the s.w. of Africa; whilst the SICILIAN B., formerly used in medicine, is prodeced by *daucus gummifer*, a species of the same genus to which the carrot belongs, growing on the coasts of the Mediterranean.—The B. mentioned in Gen. ii. 12 is probably not a gum-resin at all; but what it is, is uncertain.

BEACH, MOSES YALE, 1800–68; b. Conn.; in early life a cabinet maker; inventor of a rag-cutting machine for paper mills, and of an engine for propelling balloons. After trying paper manufacturing, in 1835 he acquired an interest in the *Sun*, a penny daily paper begun in New York about three years earlier. He soon became sole proprietor, and was for years one of the pioneers of the penny press. Leaving the paper to his sons, he retired in 1857 with an ample fortune.

BEACHES, RAISED. Modern geology teaches that the frame of the land is liable to risings and depressions, even in the present age. Several districts in different parts of the world have been raised, in consequence of earthquakes, within the remembrance of the present generation. There is good proof that certain parts of eastern Sweden, bordering on the gulf of Bothnia, have been elevated about 3 ft. within the last hundred years. These facts prepare us to learn that, around the British islands, and in other parts of the earth, there are tracts of ground at various elevations above the present sea-level, which have evidently been sea-beaches at a former time. The evidences consist of—first, the levelness of the ground in the general direction of the present shores over considerable spaces; second, the alternating beds of sand and gravel, such as we see composing the present B.; and, third, the presence of marine shells, which, in our country, are generally of species now living in the boreal seas. There are also what may be called terraces of erosion—indentations made in a rocky coast by the lip of the sea in ancient times—usually consisting of a flat platform presenting patches of gravel, and of a backing wall or sea-cliff, the latter sometimes penetrated with deep caves. In Scotland, there is a very decided terrace of erosion all round the bold coasts of the w. Highlands and Western islands, at an elevation of about 25 ft. above the level of the similar, but scarcely so well-marked indentation which the sea is now making. In Lapland, there is a similar terrace, but stooping from 220 to 85 ft. in the course of 30 miles. There is also a clear and well-marked terrace of the same kind, at about 520 ft. above the present sea-level, behind Trondhjem in Norway. The whole subject is treated elaborately in *Ancient Sea-margins*, by R. Chambers, 1848, where a series of gravelly terraces are described as existing in Scotland at various heights above the sea, telling of an uprise of the frame of the land in stages, and indicating by their uniformity of level that this movement was equable.

BEACH PLUM, *Prunus maritima*, a sea-beach shrub of the Atlantic coast of the United States, bearing fruit much like the common garden plum. It abounds on the low sandy shore at the eastern end of Long island toward Montauk, and occurs from Massachusetts to Virginia.

BEACHY HEAD, the loftiest headland on the s. coast of England, projecting into the English channel, 2½ m. s.s.w. of Eastbourne, Sussex. It consists of perpendicular chalk-cliffs, 564 ft. high, forming the e. end of the South Downs. Several caverns have been cut out in the rock, for shipwrecked seamen to take refuge in; but shipwrecks have been far fewer since 1828, when the Bell Tont lighthouse was built here. This lighthouse is 285 ft. above the sea, in lat. 50° 44′ 24″ n., long. 0° 12′ 42″ e., and is seen above 20 m. off. The view from B. H., in clear weather, extends to Hastings, the Isle of Wight, and France. The cliffs are the resort of myriads of sea-fowl. Off this point, the French fleet beat the combined English and Dutch fleets in 1690.

BEACON (allied to *beck* or *beckon*, to give a signal), denotes any signal set upon a height, but especially the alarm-fires at one time used to spread the intelligence of foreign invasion or other great event. These fire-signals were in use in the earliest times, and notices of them are found in the literary remains of ancient Persia, Palestine, and Greece. They were made by kindling a pile or bale of wood on the tops of lofty mountains, and keeping the flame bright by night, or having the fire so covered as to emit a dense smoke by day. There were various preconcerted modes of exhibiting the light or smoke, so as to indicate the nature of the intelligence. Thus, an act of the parliament of Scotland, in 1455, directs that one bale on fire shall be warning of the approach of the English in any manner; two bales blazing beside each other, that they are *coming indeed;* and four bales, that they are coming in great force.

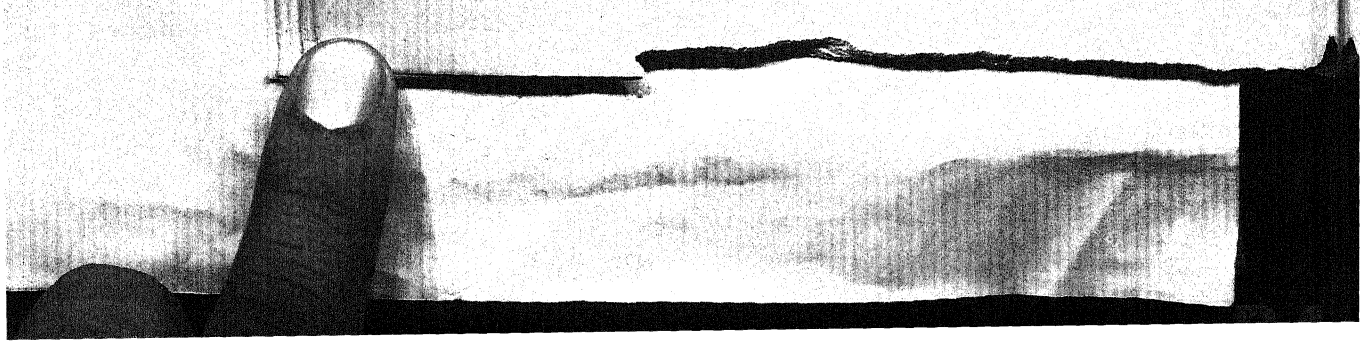
An early instance of B. signals is found in the book of the prophet Jeremiah, in his call, in chap. vi. 1, to the people of Benjamin to kindle a fire signal on one of their mountains: "Set up a sign of fire in Beth-haccerem; for evil appeareth out of the north, and great destruction." An instance of the use of a line of beacons in very ancient times is given in a passage of the tragedy of *Agamemnon*, by the Greek poet Æschylus. The commander-in-chief of the Greek army at the siege of Troy is represented as communicating the intelligence of the fall of the city to his queen, Clytemnestra, at Mycenæ, in the Peloponnesus. The line consists of eight mountains, and the news is supposed to be conveyed in one night from Troy.

In England, the beacons were kept up by a rate levied on the counties, and had watches regularly stationed at them, and horsemen to spread the intelligence during the day, when the beacons could not be seen. They were carefully organized while the Spanish Armada was expected. In the beginning of 1856, an old B. work on Malvern hill, in Worcestershire, which had done its part in the former days in spreading the intelligence of the appearance of the Armada, of the approach of the Young Chevalier, and of that of the Dutch fleet afterwards, dealt with by admiral Blake, was lighted up in anticipation of the close of the Crimean war, and afforded an interesting amusement to scientific persons in estimating the distance at which the blaze could be seen from distant mountains.

BEACON, in maritime affairs, is a signal for warning against dangers, or for indicating the proper entrance into a channel, harbor, or river. Generally speaking, a B. is fixed; whereas a *buoy* floats. The power of constructing these beacons rested at one time in the sovereign; but in 1565 an act of parliament empowered the Trinity house corporation to erect them on such parts of the sea-coast and forelands as appeared to be most in want of those safeguards; and tolls were levied on the maritime counties for their maintenance. In recent times, the construction of *floating* beacons has occupied a good deal of attention, as it is conceived that they might in many cases supply the place of much more costly light-houses. Messrs. Brown and Lenox have constructed for the Trinity board a B. for the Goodwin Sands—comprising a hollow wrought-iron floating vessel, with 6 water-tight compartments; a tower 28 ft. high, tapering in diameter from 7 to 3½ ft.; and a ball at the top of 3½ ft. diameter. This B was visible from a considerable distance; but some leakage frustrated its continued use. Mr. Herbert, in 1854, introduced a new B., intended to float upright in all states of the winds, tides, and currents; and others of similar character have since been invented. Many beacons are now made in which a bell is sounded instead of a light shown, as a warning. One by Messrs. Brown and Lenox is so constructed as to yield a continuous bell-ringing, so long as tide or current is flowing. There is a keel at the bottom, to make the B. turn with the tide. There are channels below the line of flotation, through which the tide-water or current flows; the water causes two undershot wheels to revolve; and this revolution, by means of axes, cranks, rods, guides, and levers, is made to bring the force of a hammer to bear on a bell. Some beacons on this principle have a bell of 2 cwt. Nearly allied with beacons, although not strictly such, are *gong*-beacons, of which about 40 have been supplied to light-vessels on the English and Welsh coasts. Fog sirens, fog whistles, and fog horns, are similarly employed; and a parliamentary paper, published in 1873, gives interesting details on this subject; but these audible signals are connected with light-houses or light-ships, and are only beacons in an indirect sense. See BUOY and LIGHT-HOUSE.

BEAD, BEADE, or BEDE (allied to "bid"), in Anglo-Saxon and Old English, signified "a prayer," and hence came to mean the small perforated balls of gold, silver, glass, ivory, hard wood, etc., used for keeping account of the number of prayers repeated. A certain number strung on a thread makes a rosary (q.v.). A *bedesman* or *bedeswoman* is one who prays for another. Persons of station and wealth in old times "had regularly appointed bedesmen, who were paid to weary heaven with their supplications." Bedesmen appointed to pray for the king and state, sometimes lived together, and hence *bedehouse* is synonymous with an almshouse. A common form of signature at one time was: "Your bounden bedesman," or, "Your obedient servant."

BEAD, in architecture, a small round molding, sometimes called an astragal. It is of frequent occurrence in architecture, particularly in the classical styles, and is used in picture-frames and other objects carved in wood.



BEADLE is an inferior parish-officer chosen and appointed by the vestry. His business is to attend the vestry, to give notice of its meetings to the parishioners, to execute its orders, to assist the parish constable, and generally to do and execute all the orders and business of the vestry and of the parish, as their messenger or servant. Shaw's *Parish Law*, c. 19. See PARISH; VESTRY. The B. holds his office during "pleasure, and he may therefore be dismissed at any time for misconduct by the parishioners assembled in vestry."

BEADS, a variety of personal ornament, made of various materials, as glass, pottery, metal, bone, ivory, wood, jet, amber, coral, etc., and perforated so that they can be strung on threads and made into necklaces, bracelets, rosaries, etc., or worked on cloth as a kind of embroidery. Their use is of great antiquity, for they are found in the most ancient of the Egyptian tombs as decorations of the dead, and beads supposed to have been used as barter by the Phœnicians in trading with various nations in Africa are still found in considerable numbers, and are highly valued by the natives under the name of "Aggry" beads. Ever since the 14th c., the manufacture of glass beads has been chiefly engrossed by the Venetians, and the glass manufacturers of Murano still produce fully nine tenths of all the beads made; the imports to this country alone in 1872 were 2,093,503 lbs., of the value of £105,488. The manufacture is curious; the melted glass, colored or uncolored, is taken from the pot by two workmen, who slightly expand the gathering by blowing down their blowpipes; they then open up the expanded glass, and join the two together whilst still very soft. This done, they walk rapidly away from each other in opposite directions, in a long shed like a small rope-walk, and draw the glass, which retains its tubular character given by the blowing, etc., into rods of great length, and often extremely small diameter. On cooling, which takes place very quickly, these long rods are broken up into short lengths of about a foot, and a small number of these shorter rods are placed on a sharp cutting edge, after being annealed, and are chopped into lengths. The roughly cut beads are next mixed very thoroughly with fine sand and ashes, then put into a metal cylinder over a brisk fire, and turned round rapidly as they begin to soften with the heat. They are then agitated in water, which cleans away the sand and ashes, and leaves the holes free, after which they are strung.

BEADS, ST. CUTHBERT'S, a title popularly given to the single joints of the articulated stems of encrinites (q.v.). The central perforation permitted them to be strung as beads; and from the fancied resemblance, in some species, of this perforation to a cross, they were formerly used as rosaries, and associated with the name of St. Cuthbert:

> On a rock by Lindisfarn
> St. Cuthbert sits, and toils to frame
> The sea-born beads that bear his name.

They are also known as entrochites, or wheel-stones.

BEAGLE, a small variety of hound, formerly much used in England for hare-hunting. It has now been almost wholly superseded by the harrier (q.v.), to which its name is also sometimes given. The true B. is smaller than the harrier, not above 10 or 11 in. in height at the shoulder, sometimes considerably smaller, stout and compact in make, with long pendulous ears, smooth-haired, sometimes dark-brown, with a streak or spot of white about the neck, sometimes white with black or reddish spots. There appears to have been also a rough-haired variety. The B. is remarkable for its exquisite scent and perseverance; and although much distanced by the hare at first, is almost sure to kill it. It was customary in England, in former times, when beagles were used, to follow the chase on foot, a hunting-pole being employed to assist in leaping. During the chase, the B. gives utterance to a cry which has been regarded as particularly musical; and queen Elizabeth had little "singing-beagles," one of which could be placed in a man's glove. The smaller beads were preferred, perhaps, at first, for the prolongation of the chase; and the diminutive size of a pack or "cry" of beagles became a boast. The smallest are sometimes called *lap-dog beadles*. The origin of the name B. is uncertain.

BEAK. See BILL.

BEAKED, BECQUÉ. When the beak of a fowl is of a different tincture from the body, it is then said, in heraldry, to be beaked of such a tincture. If its legs are of the same tincture, it is then beaked, and membered so and so. In place of beaked, Guillim commonly says "armed."

BEAKER, a term formerly in use, signifying, a kind of drinking-bowl or cup, derived from the same root as the German *becher*, the Italian *bicchiere*, or the barbarous Latin *baccarium*. The Scotch call a hooped wooden dish a "bicker."

BEALE, LIONEL SMITH, b. 1828; an English physiologist and microscopist, professor in the university of London. He has written in opposition to Darwin's theories. Among his productions are *How to Work with the Microscope*, *The Structure of the Tissues of the Body*, *Protoplasm*, etc.

BEAM (Ger. *baum*, Dut. *boom*, Ang.-Sax. *beam*, signify "a tree"), any piece of wood, long like a tree. In the arts, the word has many special technical applications. It is the name, for instance, of three parts of a weaving-loom (q.v.), for a part of the balance (q.v.), and for a part of the steam-engine (q.v.). In ship-building (q.v.), it is applied to

any of the transverse pieces of framing extending across the hull. In ship measurement, it means breadth at the wales. See TONNAGE. B., in engineering, is a strong stay of wood or of iron, for supporting lateral pressure. See STRENGTH OF MATERIALS.

BEAM, of a ship, is one of the main timbers which aid in supporting the decks. Beams stretch across from side to side, aiding to strengthen and uphold the sides of the hull as well as the decks; and they are themselves supported at the ends by massive pieces, called knees, standards, and clamps. Each is made of one fine piece of timber, if possible; but if the length be too great for this, two or more timbers are scarfed together. Wherever it is practicable, the beams are upheld at or near the middle by pillars. In the *Great Eastern* steamship, the beams are of iron, and, like most other parts of the vessel, are cellular in construction. In the old timber-built sailing ships-of-war, now rapidly becoming obsolete, the *beak-head* B. was the broadest in the ship; the *midship* was the longest; the *orlop* was that which supported the orlop deck, and strengthened the hold. The old 74-gun ships had each 24 beams under the lower deck. Many of these characteristics still prevail; but others have given way to change, owing to the increased length of war-steamers, and to the necessity of making room for the machinery. The beams of all ships are generally made deeper in the middle than at the ends, in order that the decks supported by them may have a slight convexity on the upper surface, to carry off the rain-water readily, and to lessen the recoil of the guns.

The position of the beams, stretching across a ship at right angles to the direction of the keel, has given origin to many technical phrases used on shipboard. "On the starboard B." is applied to any distant point out at sea, at right angles to the keel, and on the starboard or right hand—as viewed from the stern—side of the ship. "On the larboard B." similarly applies to the left hand. "On the weather B." is that side of the ship which receives or is towards the wind. "Before the B." is the bearing of any object when seen more in advance than *on* the beam. "Abaft the B." is the reverse of the expression just noted. "On her beam-ends" is applied to the position of a ship when so much inclined to one side that the beams become nearly vertical.

BEAMAN, FERNANDO C., b. Vt., 1814; practiced law in Adrian, Mich., where he was probate judge, presidential elector, and member of congress. He was an early opponent of the extension of slavery. His standing in the legal profession is high.

BEAMING is a handicraft process in the cloth-manufacture preliminary to weaving, and was formerly done by the weaver himself; but it has long since become a special employment, followed by workmen trained to the business as beamers, and, like hand-weaving, is tending to extinction by machinery—warping and beaming, in weaving by power, being conjoined into one operation. See WEAVING. B. is simply the art of winding the web on the weaver's beam in a manner suitable for weaving—the two essential requirements being firmness in the winding on of the web sufficient to withstand the reaction of weaving, and evenness in the spreading of the yarn at the required width. This is effected by what is called a beaming machine, which is simply a kind of roller-mill, extending from end to end of the beamer's shop. The weaver's beam, on which the web is to be wound, is set horizontally on two upright standards at the one end of the shop, and at the other end there is a friction-roller, set likewise level in a heavy frame, fixed to the floor, on which the web is wound like a rope, with the thrum-end out.

The number of pins or strands in the web being known, the beamer has merely to take a ravel (a comb-like utensil) with the corresponding number of teeth in the breadth required for the web, and filling each tooth successively with its respective pin, the spreading is completed; and the web being attached to the beam, the winding on of the web is a common crane operation, in which the tension on the yarn is regulated by the friction on the friction roller. The beamer may thus beam for 400 weavers. The price of beaming a web varies from 3*d.* to perhaps 8*d.* or 10*d.*

BEAM-TREE, WHITE (*pyrus aria*, see PYRUS), a tree of 20 to 40 ft. in height, a native of almost all parts of Europe and of corresponding climates in Asia, not uncommon in the mountainous districts of Britain, and frequently planted. It has been variously referred by botanists to several allied genera, *sorbus*, *cratægus*, and *mespilus*. It has a straight erect trunk, and a round or oval head; the leaves are ovate, cut and serrated (in some varieties, deeply loped), white and downy beneath; the flowers in large terminal corymbs; the fruit scarlet, of the size of small peas. The fruit is acid and astringent, but becomes agreeable by incipient decay; it is sometimes called sorb or service-berry, and resembles the true service (q.v.) in quality, although much smaller. Beer is made of it by fermentation. The wood is very hard and fine-grained; it is used for cogs for the wheels of machinery. The whiteness of the foliage makes the tree—sparingly introduced—ornamental in plantations.

BEAN, *Faba*, a genus of plants of the natural order leguminosæ, sub-order *papilionaceæ*, included by Linnæus and many other botanists in the genus *vicia* (see VETCH), from which it is distinguished chiefly by the leathery tumid pods, spongy within, and by the large scar on the end of the seed.—The COMMON B. (*F. vulgaris*, *vicia faba* of Linnæus) is somewhat doubtfully supposed to be a native of the borders of the Caspian sea; it has been in cultivation from remote antiquity in Europe as well as in Asia. It is

an annual plant, generally from 2 to 4 ft. high, with thick angular stem, leaves with 2 to 5 oval leaflets, and destitute of tendrils. The pods are thick, long, and wooly within; the seeds more or less ovate and flattened. The flowers, which are almost without stalks, are ordinarily white, with a black spot in the middle of the wing: but there is a variety with flowers entirely white, and another in which they are scarlet. The flowers are deliciously fragrant. Burns alludes to this in the lines—

"The zephyr wantoned round the bean,
And bore its fragrant sweets alang."

A field of beans perfumes the summer air for a considerable distance. The varieties and sub-varieties in cultivation are very numerous, differing in the size and form of the seed, the color of the flower, the period which they require for growth, the height, the stem in some unbranched, in others divided at the base into a number of stalks—the pods in some mostly solitary, in others clustered, etc. The B. is cultivated both in fields and gardens, and the seeds (beans) are used for feeding cattle, also for making a sort of meal for human food, and in a green state are put into broths or boiled for the table. They are very nutritious, containing when ripe about 36 per cent of starch, and 23 per cent of legumine, a nitrogenous substance analogous to the caseine of milk. Whether for man or for cattle, however, they particularly require to be mixed with other food. The straw is used for fodder, and is very nutritious when cut before it is fully ripe. The B. succeeds best on a dry and moderately rich soil. A well-drained clay is very suitable for it. Its tapering and deeply penetrating root unfits it for shallow soils. The varieties of B. preferred for the garden are generally much larger, both plant and seed, than those cultivated in the field. The Windsor B. has seeds of a flattened, almost circular shape, fully an inch in diameter; whilst those of the horse B., or tick B., cultivated as a field-crop, are often not more than half an inch in length, and not quite three eighths of an inch in breadth. Garden-beans, in Britain, are usually sown in spring, in rows 2 ft. or more apart; and sowings are made at different dates, that there may be a succession of unripe beans for culinary use. The Windsor, Long Pod, and Early Magazan are among the most approved garden varieties.

The roots of the B. are diuretic, and a decoction of them has been used with advantage in cases of dropsy.

B. crops are very liable to be injured by a species of aphis (q.v.) *A. fabæ*, sometimes called from its color the collier aphis, and sometimes the black dolphin fly, which destroys the leaves, and so renders the plants incapable of bringing the ordinary amount of seeds to perfection. The most effectual remedy known is to cut off the tops of the plants, which are always first attacked, as soon as the aphis appears, and so to prevent its multiplication. The *topping* of beans is regarded by many gardeners as a good practice, even when they are quite free of the aphis.

The kidney B. (q.v.), or haricot (*phaseolus vulgaris*), is an entirely different plant from the common bean.

BEAN, in agriculture. The B. was cultivated to a small extent at least in ancient times, both in Palestine and Egypt. The Roman family of the Fabii are said to have derived their name from this plant. It requires a rich or alluvial land to grow the B. in perfection, and hence it is only found entering into a regular rotation of cropping upon soils of the best class. Since the introduction of maize into the s. of Europe, the land under this plant has been considerably restricted. The maize thrives better, and is far more productive than the B., in warm climates. In the n. of Europe, too, the potato, flax, beet, and other fallow crops are more productive and certain. Indeed, the high summer temperature of the continents of Europe and America is by no means favorable to the growth of the B. In the w. of England, the summers are rather too moist for its yielding its seeds in abundance. The straw and haulm are apt to be developed too much, and the blossoms do not set well. Beans are largely cultivated on all the better descriptions of clay soils in the eastern counties, such as Kent and Suffolk. The variety most generally grown there is the *common tick or field B.*, having much resemblance to the *Scotch or horse-bean.*

The modes of cultivation are very various, and a large breadth is still sown broadcast. The great objection to this mode is the liability of weeds to spring up and check the growth of the crop. Beans are considered one of the fallow crops; but the soil, after it has borne a crop of beans, is little fitted for a cereal crop, unless it has been hoed and kept clean in summer. To effect this end, beans are usually sown in rows, and hoed during their early growth either by the hand or horse-hoe. In preparing the land for a B. crop in England, the stubble, after being liberally dressed with farm-yard manure in autumn, receives a deep furrow, so as to expose the soil to the winter frosts. The surface is then scarified, and after being harrowed, the beans are sown in drills of 18 in. in width, at the rate of 3 to 3½ bushels per acre. The sowing begins as soon after the month of Jan. as the soil admits of the necessary operations, and may be practiced up to the middle of March. The earlier the crop is put in, the better in general is the chance of its being productive. The greater liability of the eastern counties to drought, renders the crop more subject to the attacks of insects, such as the "black dolphin," or *B. aphis*, which usually makes its appearance as soon as the plant suffers from the want of moisture. For this reason, the B. crop is rather an uncertain one in the climate of the eastern coun-

ties, and other crops are gradually encroaching on the breadth which it used to occupy. The Russian or winter beans are sown in these counties to some extent in autumn, and from ripening earlier, often escape the attacks of vermin, and suffer less from the drought.

Perhaps East Lothian is as favorable, in respect both of soil and climate, to the cultivation of the field B., as any part of Europe. The summers are comparatively cool, and the rains generally moderate, and pretty well diffused over the growing season. The crops are less liable to depredations of the "black dolphin," and the long period over which the growth of the plant is extended, is favorable to large crops. Sometimes the crop is sown broadcast, when the land is clean and well manured; and it is said that as large crops have been raised in this way as by sowing in rows. The produce by this mode of cultivation, however, is much more irregular, and the land is often left in a foul condition. Drilling is therefore the general practice in cultivating this crop in the Lothians. The stubble is usually manured and plowed in autumn, and when the weather admits, in spring it is plowed again, and the beans are sown by a small machine in every third furrow; or the land is merely plowed in autumn, and farmed into drills or ridges by the double mold-board plow in spring. Into these the farm-yard manure is put and spread, and the beans are sown above it either broadcast or by a three-barreled machine. The seed is then covered by the double-molded plow, as in the planting of potatoes. By this mode, the plants receive a plentiful supply of nutriment in their early stages of growth. When land is out of condition, or when the crop is sown upon lighter and inferior descriptions of soil, this is perhaps the most advisable method to follow. Mr. Hope, during his tenancy of Fentonbarns, introduced the English method of cultivation into East Lothian. The stubble is dunged and plowed in autumn, and as soon as the land is dry in spring, about three bushels of beans are drilled, 18 in. apart, by means of Garrett's machine. As soon as the crop appears above ground, Garrett's lever horse-hoe is put over the ground, to stir the surface, and keep it free from weeds. During the spring and early summer, the horse and hand hoeing are repeated as often as it is deemed advisable, until the crop covers in the land by its abundant foliage, and keeps down all weeds. Mr. Hope's experiments indicated that the yield of grain is greater by the narrow than by wide drilling.

In England, the crops of beans vary from 20 to 40 bushels per acre; but in dry and warm seasons the produce often falls below the first-named quantity. The weight per bushel is from 60 to 64 lbs. On some of the best soils in Fife, and in the Lothians, as many as 60 bushels per acre are obtained in favorable seasons, and the weight of the bushel is sometimes as much as 66 lbs. In Scotland the straw is more abundant than in England. It forms good fodder both for cattle and horses, as well as supplying material for the dung-heap. Beans are usually cut by the sickle, allowed to lie a few days unbound to winnow, and when bound, put up into *stooks*. In late seasons, when there has been a considerable growth of leaves, they are often long before they are ready for carrying to the stack. Notwithstanding the relatively high price of beans, the breadth under this crop has been diminishing also in Scotland. It is said that the draining of the soil has not been so beneficial to the B. as to other crops. The greater returns which the land gives under potatoes in the B. soils of Fife and the Lothians since the opening of the railways, has encroached upon the extent formerly assigned to it in the six-course rotation. In the Carse of Stirling and Falkirk, it retains its hold much better, and forms the chief preparation for the wheat crop. The field B. is now little used as an article of human food. It is considered to be specially adapted for the feeding of horses which are subjected to hard work. For this purpose, it is usually roughly ground, and mixed with a little bran. In the winter season, a portion is often boiled, and given to them at night. When the price is moderate, a mixture of ground beans and oilcake, or linseed, is much esteemed for milch cows, as well as for fattening cattle and sheep. Special or light manures are less applied to the B. crop than to any other. In many instances, nitrate of soda and sulphate of lime have been used with advantage, but farm-yard manure is almost essential to its free growth.

BEAN, St. Ignatius's. See Strychnos.

BEAN-CAPER. See Zygophyllaceæ.

BEAN GOOSE. See Goose.

BEAN-KING'S FESTIVAL, a social rite principally observed in France, from which country it would seem to have been transplanted to Germany. On the evening of Twelfth day (q.v.), or, as the Germans call it (in allusion to the legend, that the wise men of the east who came to worship Christ were three kings), Three Kings' day (*Dreikönigstag*), companies assemble to spend a few hours in mirthful relaxation. A large cake is baked, with a bean hidden somewhere in it. The cake is then divided into pieces, each person present receiving one, and whoever obtains the piece with the bean is king for the year. In this capacity he holds a mock-court, and receives the homage of the company, who also amuse themselves with other diversions. The bean king, however, is compelled to pay for his dignity, for he has to give an entertainment on the next Twelfth night, that an opportunity may be afforded to choose another king. In France, this custom was at an earlier period so common, that even the court indulged in it, although the church, in the 17th c., exerted itself zealously for its suppression. The opinion that the B. K. F. owes its origin to the Roman saturnalia, when even the chil-

dren, partaking in the universal glee, were wont to elect a king, is not destitute of probability.

BEAR, *Ursus*, a genus of quadrupeds, the type of a family called *ursidæ*, belonging to the order *feræ*, sub-order *carnivora*, and tribe *plantigrada*. In the ursidæ or B. family, are included not only the true bears, but also badgers, gluttons, and wolverines, racoons, coatimondis, binturongs, the kinkajou, the panda, etc. (See these articles.) Walking on the whole sole of the foot (plantigrade), the animals of this family are not, in general, capable of running very swiftly; and the nearly equal length of their fore and hind legs unfits them for leaping; most of them are also heavy both in form and gait. But whilst thus deficient in the powers which other carnivorous animals possess for obtaining prey, they really exhibit the same beautiful mutual adaptation of endowments and wants; they are, in fact, by no means strictly carnivorous; no animals are more thoroughly omnivorous than some of them; whilst others, even of the true bears, always give a decided preference to vegetable food when it can be obtained, and their teeth and digestive organs are in exact accordance with such tastes. Their jaws are much more elongated than those of feline animals, and their bite proportionally less powerful, although some of the bears are still very formidable from their great general strength and the size of their canine teeth. Their claws are not retractile, and are adapted for digging in the earth, or for climbing trees, rather than for seizing prey. All animals of the family have five toes to each both of the fore and hind feet.

Bears have six cutting teeth above, and six below, one canine tooth on each side in each jaw, with four false molars and two molars (or grinders) on each side above, and four false molars and three molars below. The false molars are, in general, soon lost by the more carnivorous species. The true molars are very large and tuberculous, the false molars comparatively small. The tuberculous crowns of the molars exhibit the adaptation to vegetable food.—The tail in all species of B. is very short, so that some of them almost appear tailless. Most of them may be described as nocturnal in their habits.

Bears are found in Europe, Asia, and North and South America, and both in warm and cold climates, the species belonging to cold climates being in general the most fierce and carnivorous. The ancients mention them as occurring in Africa; it must, therefore, be regarded as a curious circumstance that no recent accounts make certain the existence of any species in that continent. Nor is any known to belong to Australia.

The common B. of Europe, or brown B. (*Ursus Arctos*), was at one time a native of the British islands. Bears were carried from Britain to Rome, for the cruel sports in which the Romans delighted, and they certainly were not exterminated in Scotland before the latter part of the 11th century. The brown B. is usually about four ft. long, and two and a half ft. high. Its claws are about two in. long, and much curved. It has a convex forehead, and generally a brown fur, which is somewhat woolly in the younger animals, but becomes smoother with age. It produces from one to three young ones at a birth, which remain blind for about four weeks. It is generally believed to be the only European species, although different varieties occur; and one, the black B., has been regarded by some naturalists as specifically distinct. The common B. is very widely distributed over the whole of Europe and of the n. of Asia, Japan, and North America. In America it is known as the Barren Ground Bear. It is a solitary animal, and generally inhabits mountainous regions or thick forests. It sometimes preys on lambs, kids, etc.; is fond of fish, which in some countries, as in Kamtchatka, constitute a great part of its food; climbs trees in quest of honey, eats also fruits and vegetables, and in confinement, exhibits a strong appetite for bread. It usually prefers vegetable to animal food. The skin is valued for making fur-cloaks, etc.; the flesh is used as food, often in the shape of hams, as is that of the American Black B.; the paws are esteemed a delicacy. The fat (bear's grease) is in great request as an unguent for the hair. The intestines are used in Kamtchatka, instead of glass, for windows. To the people of Kamtchatka, indeed, bears, which are there very abundant, afford many of the necessaries and comforts of life.—The common B., like others of the genus, in cold climates, usually spends the winter in a torpid state. It selects a cavern or the hollow of a tree for its hybernation, or makes a hole for itself by digging; it is also said, but this needs confirmation, sometimes to construct a sort of hut with branches of trees, lined with moss. The winter being spent without food, it is said to be very lean on the return of spring. This and other species of B. are very often killed in their winter dens.

The American black B. (*ursus Americanus*) is found in all parts of North America. Its total length seldom exceeds 5 feet. The fur is soft and smooth, and generally of a glossy black; but there are varieties of other colors, as the cinnamon B., the yellow B., etc. The American black B. usually exhibits a timid disposition; seldom attacks man; feeds chiefly on berries, when they can be obtained; occasionally visits gardens for the sake of cabbages and other vegetables; and strongly prefers vegetable to animal food, but has recourse to the latter when pressed by hunger, and in such circumstances occasionally approaches human habitations and captures pigs, which it endeavors to carry off. In such cases the B. walks on its hind-legs, the pig being firmly squeezed between its fore-paws and breast, making a noise which frequently leads to a rescue. This and other species of B., when assailed, not unfrequently hug their adversaries in the manner here described, when their strength renders them very dangerous. The skin of the

American black B. is used for caps, rugs, etc., and great numbers are annually killed upon this account, chiefly by the Indians in the employment of the Hudson's bay company. Almost 10,000 skins are annually imported into Britain, of which, however, the greater part are again exported. In the beginning of the 19th c., the number imported was more than twice as great as now; the skins were also of much higher price. A B.'s skin is still worth from £1 to £3.—The grizzly B. (*U. ferox*) of North America, found chiefly on the Rocky mountains and the plains to the eastward of them, from Mexico to lat. 61° n., is much larger than either of the species already noticed, and much more fierce and carnivorous. It sometimes measures more than 9 ft. from nose to tail, and the claws of the fore-feet more than 6 in. in length. It has a lengthened and narrowed muzzle, a very short tail, and long grizzled hair. No animal of the new world is more formidable than the grizzly B. It is capable of overpowering the bison, and dragging away the huge carcass. It feeds, however, also on fruits and roots.—The arctic B., or polar B., also called the white B. (*U. maritimus*), resembles this species in size and fierceness, but is very distinctly characterized by its flat head and comparatively long neck. It has a smooth white fur. It is the only known species of B. which is strictly marine in its habits, never being found far from the sea. It inhabits the most northerly shores of Asia and America, Spitzbergen, etc., where it pursues seals, both in the water and upon the ice, and preys upon fishes, birds, etc. Amongst the articles of its food are eggs and berries in their season, and in confinement it will subsist long on bread and other vegetable food. Like other species of the genus, it displays great affection for its young, and will brave all dangers in their defense.—Of other species of B., the Syrian B. (*U. Syriacus*) may be mentioned, as perhaps the species particularly intended by the name B. in the Old Testament. It is generally of a dingy-white or brown color, and has a stiff mane of erect hairs between the shoulders. Flocks are not safe from it, yet it more frequently commits ravages on crops of pulse. In its habits generally, it much resembles the common B.; as do also the Thibet B. (*U. Tibetanus*), and the spectacled B. (*U. ornatus*), so called from semicircular yellow marks above its eyes, a native of the Andes of Chili.—The long-lipped B., or sloth B. (*U. labiatus*), of the East Indies, is the kind commonly led about by Indian jugglers. Its long hair, short limbs, high back, peculiarly uncouth appearance, and gentleness of disposition, recommend it for this purpose. In a wild state, it is said to feed chiefly on fruits, honey, and ants. It possesses in a remarkable degree the power, common in some measure to all the bears, of protruding the lips in order to lay hold of food.—Some other East Indian species, which feed chiefly on fruits and honey, are known as sun-bears, as the Malayan B. (*U. Malayanus*) and the Bornean B. (*U. eurysplus*). They are characterized by an extremely long extensile tongue. They are of gentle disposition, and become very affectionate when tamed. Sir Stamford Raffles had a Malayan B., which was very playful and quite harmless, although a powerful animal, and which showed refinement of taste in refusing to eat any fruit but the mangosteen, or to drink any wine but champagne. This species in a wild state does much damage to cocoa-nut plantations, by climbing the trees, and eating off the terminal bud, when it is said also to drink the sap (toddy) which flows out in abundance.

Remains of several extinct species of B. have been discovered in caves in Germany, England, and other countries, some of which appear to have been larger than the present bears of Europe, and of more decided carnivorous propensities. Of these, the *U. spelæus*, or great cavern B., has the skull of considerable vertical elevation from the upper end of the muzzle, and larger than that of the biggest brown bear. The *U. arctoideus* has a skull nearly of the configuration of that of the *U. Americanus*, and of the size of that of *U. spelæus*. The *U. priscus*, or ancient B., has the skull of a smaller size, and differing less from that of living bears.

Ant B. is a name of the great ant-eater (q.v.).

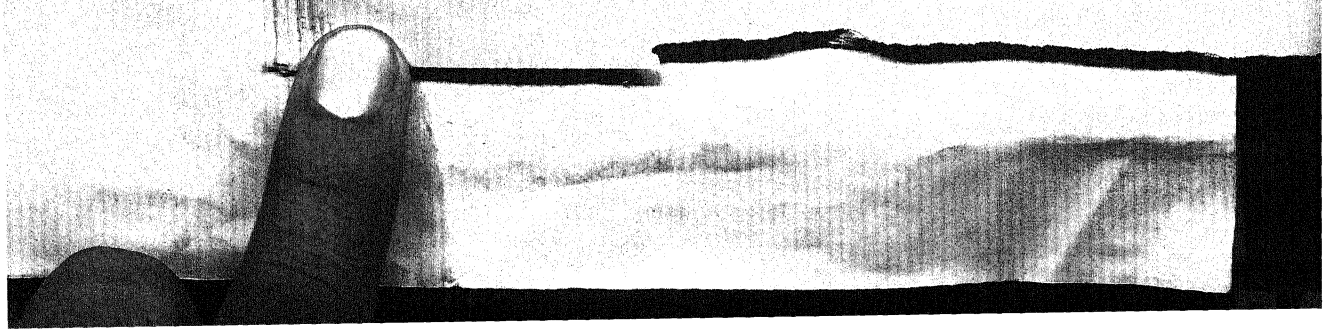
BEAR, Bere, or Beer. See Barley.

BEAR, Great and Little. See Ursa Major and Minor.

BEAR-BAITING. In different countries, bears were formerly made objects of cruel sport, by being baited with dogs. In England, B. was one of the established amusements, not only among the common people, but among nobles, and even royalty itself; it is related that queen Elizabeth did not consider it unbefitting her sex or rank to attend these rude entertainments. Pennant, in his *Zoology*, quoting from *The Household Book of the Earls of Northumberland*, says: "Our nobility also kept their bearward; twenty shillings was the annual reward of that officer from his lord, the fifth earl of Northumberland (who died 1527), 'when he comyth to my lorde in Christmas, with his lordshippe's beests for making his lordschip pastyme the said twelve days.'" The places where bears were kept and publicly baited were called bear-gardens. There is a spot in the neighborhood of the court at Westminster, which, until lately, was known as the bear-garden. B., like bull and badger baiting, has long been unknown in England.

BEARBERRY. See Arbutus.

BEARD, the hair which grows on the upper lip, and on the chin and cheeks of the male sex. It is usually, though not always, of the same color as the hair of the head, but somewhat shorter, stronger, and more wiry; it is invariably the color of the hair on



the eyebrows. The B. is the distinctive sign of manhood. In women, an incipient B. sometimes appears in the later years of life. Instances also occur of women with a B. almost equal to that of the male sex, but these are recorded as prodigies. The B. is generally luxuriant in persons of the Slavic and Celtic races. The aborigines of America, who are naturally almost beardless, make themselves entirely so by plucking out the hairs of the beard. In early times, the B. was considered by almost all nations a sign of strength and an ornament of manhood, was carefully cherished, and even regarded as sacred. Among the Turks, Arabs, Persians, and many other nations, the removal of the B. was, and is yet to a very great extent, regarded as a severe punishment and an extreme degradation. The case of David's ambassadors, recorded in 2 Samuel, chap. x., illustrates the same feeling as prevalent among the ancient Jews. The Moslems carry combs constantly about with them for the purpose of dressing the beard. It is common to do so immediately after prayers, the devotee remaining on his knees during the operation. The hairs that fall out are then carefully picked up and preserved for entombment with their owner when he dies; frequently he himself deposits them beforehand in his destined tomb. The ancient Jews did not dye their beards, and the Turks rarely, but the practice was common among the Arabs and Persians. The Arabs dyed the B. red, not only because dye of that color (being merely a paste of *henna* leaves) was easily obtainable, but because it was an approximation to golden yellow, the color recommended by their prophet Mohammed, who hated black, the color the Persians preferred. The Persian kings are said to have interwoven their beards with gold thread. It is customary among the Turks to anoint the B. with perfume, and to smoke it with incense. The Jews also anointed their beards. The Moslems commonly clipped their whiskers, the Jews did not. The Egyptians shaved their beards except in time of mourning, when they let them grow. From some of the ancient Egyptian statues, however, it would appear that beard-cases were worn, which would seem to indicate that the practice of shaving was not universal. The fashions of beards have been very different at different times and in different countries.

A neglected B. was a sign of mourning among the Jews. According to Levi's *Succinct Account of the Rites and Ceremonies of the Jews at this Present Time*, they are forbidden to shave or cut their nails, or bathe for 30 days after the death of a father, mother, brother, sister, son, daughter, wife, or husband. In Greece, the B. was universally worn till the time of Alexander the great, who ordered shaving, that the beards of his soldiers might not be laid hold of by their enemies in battle. Shaving was introduced among the Romans about 300 B.C. Pliny says Scipio Africanus was the first Roman who shaved every day. Subsequently, the first day of shaving was regarded by the Romans as the entrance upon manhood, and celebrated with great festivities. Under Hadrian, the B. was allowed to grow again; and this fashion prevailed till the time of Constantine the great, when it was discontinued. Peter the great compelled shaving in Russia by imposing a heavy tax upon the B., and further, by having the beards of all whom he found wearing them plucked out by the roots, or shaved with a blunt razor. The B. was commonly worn in France till the time of Louis XIII., when, because the monarch was young and beardless, the fashion changed at the court and throughout the kingdom. A similar change took place in Spain on the accession of Philip V. With regard to our own country, the Anglo-Saxons wore beards for a considerable time after their invasion of Britain; and the B. appears to have been general among the people at the time of the Norman conquest. But the Normans not only shaved themselves, but compelled the conquered to do so likewise; and many of the English preferred to leave the country rather than submit to have their whiskers shaved. It would appear, however, from the sculptured representations on the tombs of kings and nobles, that not very long after the conquest some of the Normans adopted the custom they had prohibited among the vanquished. Edward III. is represented on his tomb in Westminster abbey with a very long beard. In the time of Elizabeth, beards were of the most varied and fantastic cut. Taylor, the "water-poet," thus satirizes the extravagance of beards prevailing in that and the succeeding reign:

> Some seem as they were starched stiff and fine,
> Like to the bristles of some angry swine;
> Some cut and pruned like to a quick-set hedge,
> Some like a spade, some like a fork, some square,
> Some round, some mowed like stubble, some stark bare;
> Some sharp stiletto-fashion, dagger-like,
> That may with whispering, a man's eyes out-pike,
> Some with the hammer-cut, or Roman T,
> . . . . . .
> That heights, depths, breadths, triform, square, oval, round,
> And rules geometrical in beards are found.

The B. gradually declined under Charles I.; in the reign of Charles II., whiskers and mustaches only were worn; and the practice of shaving the whole face soon became general all over Europe; and it is only within the last 70 years that the B. has been in some measure restored, the soldiers of Bonaparte setting the example. But until within the last 30 years, it was regarded by some of the continental governments as a badge significant of democratic sentiments, and as such was interfered with by police regulations. Physicians recommend that the B. should be allowed to grow on the chin and

throat in cases of liability to inflammation of the larynx or of the bronchiæ; and mustaches and whiskers are reckoned useful for prevention of toothaches and nervous diseases of the face. The British soldiers in the Crimea were allowed to wear their beards; and with some limitations, the British army generally are now permitted to do so. The wearing of the B. has, in short, been a matter of fashion in all ages and countries—an extreme in one way usually leading to an extreme in the other. At present, the tendency in England and elsewhere is to let the B. grow, though in a way suggested by the taste of the individual. The B. is itself liable to the same diseases with the hair of the head, and to a peculiar disease (*mentagra*) occasioned or kept up by shaving, consisting in a bark-like exudation from the inflamed sebaceous glands of the hair. For detailed information, see Kitto's *Pictorial Bible;* Bulwer's *Artificial Changeling* (Lond. 1653); Hotoman's *Pogónias* (Leyden, 1586), reprinted in the *Lexicon* of Pitiscus; Taylor's *Whip of Satire*, etc.

BEARD, JAMES H., b. N. Y., 1815; brought up in Ohio, and began to paint portraits at the age of 14; settled in Cincinnati, and became conspicuous in his profession. In 1846, he exhibited his first composition, "The North Carolina Immigrants," which gave him a national reputation. Among later works are "The Land Speculator," "The Long Bill," "Out all Night," etc. He has painted portraits of Clay, Harrison, Taylor, and many other public men.

BEARD, RICHARD, D.D., b. Tenn., 1799; graduate of Cumberland college, and in 1843 president thereof; from 1854 professor of systematic theology in the same institution. He is a leader in the Cumberland Presbyterian organization, and his work on *Systematic Theology* is the embodiment of their doctrines. Dr. B. has been a zealous worker for the church and for the education of the people.

BEARD, WILLIAM H., b. Ohio, 1824; brother of James H. and also a painter. He began portrait-painting when young; visited Europe, and settled in New York in 1860. His compositions are mostly grotesque or satirical; some of them are "Bears on a Bender," "Dance of Silenus," and "Court of Justice."

BEARDIE. By this name is the little fish called the loach known in Scotland. See LOACH.

BEARD MOSS. See USNEA.

BEARDSTOWN, seat of justice of Cass co., Ill., on the Illinois river, and the Rockford, Rock Island and St. Louis railroad, at the terminus of the Springfield and Illinois Southern railroad; pop. 2528. It has some manufacturing establishments, and good trade in agricultural products.

BEARING, of a ship at sea, is the direction in which she sails, in reference to the points of the compass. Or, in a more comprehensive sense, it is the direction in which each of two objects is situated in reference to the other. When the latitudes and longitudes of two places are known, their respective bearings from each other can be calculated by trigonometry. On shipboard, seamen often conveniently refer the B. of another ship, or of an object on shore, not to the points of the compass, but relatively to the line followed at the moment by the ship's keel. Thus, the B. of the distance object may be *ahead, astern*, on the *starboard bow*, on the *larboard quarter*, etc.; the bow being between the head and the midship, and the quarter between the midship and the stern.

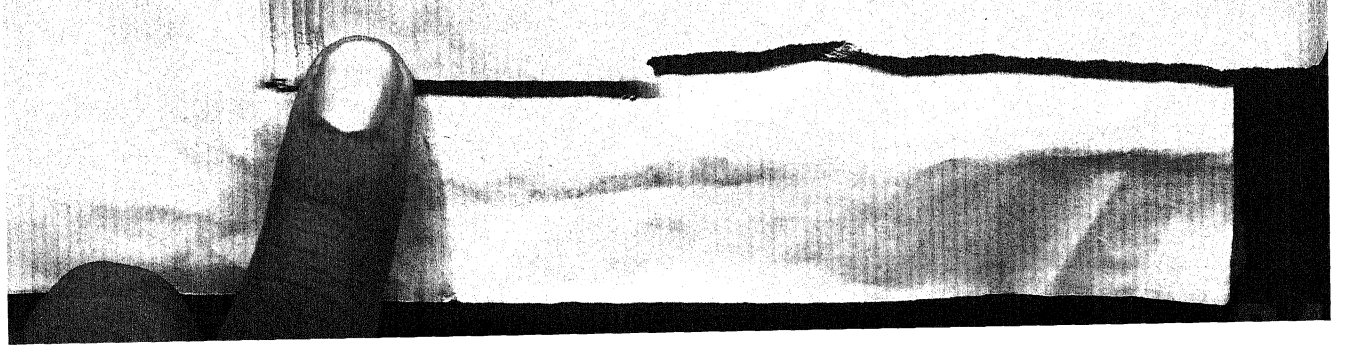
Bearing, or rather the verb *to bear*, is much used as a technical direction on shipboard. Thus, to "bear in with the land," to "bear off from the land," to "bear up," to "bear away," etc., are nearly equivalent to sailing, or steaming, or steering, in such and such directions.

BEARING THE BELL, a phrase which signifies to take the lead or first place in anything, or to carry away the prize. This old colloquial phrase is said to have originated in a practice, at the early part of the 17th c., of giving a small golden or silver bell as a prize to the winner at horse-races. See BELL. In Dudley lord North's *Forest of Varieties*, p. 175, we read:

> Jockey and his horse were by their masters sent
> To put in for the bell—
> Thus right, and each to other fitted well,
> They are to run, and cannot misse the bell.

BEAR LAKE, GREAT, in British America, in n. lat. 65° to 67°, and w. long. 117° to 123°. It is the most northerly of that chain of fresh-water seas—Huron, Superior, Winnipeg, Athabasca, Great Slave, Great Bear—which mark a continuous hollow in the middle of the continent. Great Bear lake is irregular in shape, with a surface estimated at 14,000 sq.m., equal to about half the area of Scotland. It sends forth a river of its own name to the Mackenzie. Its height above the ocean is computed at 230 feet. The climate is, of course, severe. The rigor of the winter may be inferred from the fact, that boats are sometimes blocked up by solid ice, after the crews have begun to suffer from the heat and the mosquitoes.

BEAR-LEADER. In former times, bears were led about with a chain, muzzled, and made to dance or stand on their hind-legs for popular entertainment, small dancing-dogs being usually added, for the sake of attractiveness. As a measure of police, these



somewhat dangerous and painful exhibitions are now stopped. From this old practice has been taken the phrase, bear-leader, now used jocularly to signify a discreet person who takes charge of a youth of rank on his travels to see the world.

BEAR MOUNTAIN, in Dauphin co., Penn., containing valuable beds of anthracite. The "mountain" is only about 760 ft. high.

BEARN, formerly one of the 32 provinces into which France was divided, and now forming the greatest portion of the Basses-Pyrénées. B. was a portion of Aquitania under the Romans, and after the downfall of that empire, under its ruling dukes, it was a country of considerable importance. From the intermarriage of the ruling family, the counts of Foix, with that of Navarre, sprang the French monarch Henry IV., who, because he was born and brought up in B., was derisively called the Bearnois. When he ascended the throne of France, it, of course, virtually became a part of that country; but was only formally incorporated with it in 1620 by Louis XIII. In 1813, after the British had crossed the Nive, and established themselves in Urogne, St. Jean de Luz, etc., the rich fields of B. furnished them ample supplies, the peasants taking their produce, for which they were well paid, as regularly to the British stations as to market.

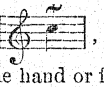
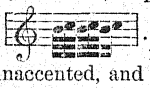
BEAR-PIT, a pit prepared for the keeping of bears, usually seen in zoological gardens. A pit of this kind is circular, measuring about 25 ft. in diameter, and 20 ft. deep. The sides are built with brick; the bottom is level, and paved with stone; and around are vaults with doors for the residence of the bears. From the center of the pit rises a stout and tall pole, on which are cross-spars at proper distances, to enable the bears to climb to the top. As is well known, the animals are fond of climbing up these poles, and catching morsels of bun from the visitors. The poles are sufficiently distant from the sides to prevent the bears from leaping out. The vaulted receptacles require to be cool and dry.

BEAR RIVER, in Utah; 400 m. long; flows into and out of Idaho, and empties into Great Salt lake. There are magnesian and other mineral springs on its banks. Coal is found where the Central Pacific railroad crosses. One of the peculiar features is a group of soda springs occupying 6 sq. miles.

BEAR'S GREASE. Under this name there are sold by perfumers and others, large quantities of pomades, tastefully done up for the toilet, and which are represented to be of great efficacy in nourishing and promoting the growth of hair. These so-called preparations of B. G. are for the most part composed of purified beef-marrow, hog's-lard, or fat of veal, and spermaceti, along with almond oil, and some scenting ingredients. The genuine bear's fat or B. G. would appear to possess the virtue of encouraging the growth of, and strengthening the hair, in an eminent degree; but the scarcity of the commodity is such that substitute fats are employed to supply the demand. See HAIR.

BE'AS, anciently *Hyphasis*, one of the five rivers which give name to the *Punjab*, or land of five waters—Jelum, Chenab, Ravee, Beas, and Sutlej. It rises on the verge of the Ritanka pass of the Himalaya, in lat. 32° 34′ n., and long. 77° 12′ e., its source being 13,200 ft. above the sea-level. After a course of about 220 m., it joins the Sutiej, 35 m. to the s.s.e. of Amritsir. It is subject to periodical rises and falls, being in the dry season generally fordable; but after the rainy months, it is sometimes nearly half a mile in breadth about 20 m. above the point of confluence.

BEASLEY, FREDERICK, D.D., 1777–1845; b. N. C.; an Episcopal clergyman; from 1813 to 1828 professor of moral philosophy in the university of Pennsylvania; author of a defense of Locke called *Search of Truth in the Science of the Human Mind*; also of works in opposition to the doctrines of Dr. Channing.

BEAT, in music, a species of embellishment written thus:  , and played as follows:  . Beat also means a signal given by the hand or foot in music to insure simultaneous performance—the hand or foot being raised on the unaccented, and lowered on the accented part of the bar.

BEAT, IN MUSIC (*ante*), a term used in the plural for the pulsations or throbbings resulting from the vibrations of two sounds of the same strength and nearly the same pitch, or two sounds alike in intensity but not in exact unison. In tuning unisons, as in the case of two or more pipes or strings, the operation is guided by beats; until the unison is perfect, more or less of beating will be heard; when the unison is very defective, the B. have the effect of a rattle. The complete absence of B. affords the best means of attaining by trial a perfect harmony.

BEATIFICATION, is a solemn act in the Catholic church, by which the pope, after scrutinizing the life and services of a deceased person, pronounces him blessed. After this he may be worshiped in a specified portion of the church, and the act holds out the prospect of future canonization, which entitles him to general worship in the church universal. B. was introduced in the 12th century. It may be regarded as an inferior degree of canonization (q.v.).

BEATING AND WOUNDING, or simply *wounding*, is the name sometimes found in law-books for the offense of inflicting on another some dangerous hurt or wound; and it has

been otherwise described as an aggravated species of battery (q.v.). A still more aggravated and atrocious offense of this kind used to appear in the list of offenses against the criminal law of England under the term MAYHEM, which was a violently depriving another of the use of a member proper for his defense, such as an arm, a leg, a finger, an eye, a fore-tooth, and some others; but it was laid down quaintly enough, that the loss of one of the jaw-teeth, the ear, or the nose, was no mayhem in common law, because these members can be of no use in fighting.

The offenses to which we have referred—viz., *battery, beating and wounding*, and *mayhem*—can, however, be best considered under the important and well-known term ASSAULT, which is indeed often used to express the above injuries, and which is implied in them all. The above offenses, it will have been observed, all involve an actual attack on and injury to the person of the party assaulted. But there may be an assault without such actual hurt. This is a *common assault*, and hence, in criminal law, assaults are distinguished by their being *common* or *aggravated*. A common assault has been defined as an attempt or offer to do a corporal hurt to another, as by striking at another with a stick or weapon, or without a weapon, though the party striking misses his aim. The principal is, that it is sufficient, in order to constitute such an offense, that there has been such an exhibition of a violent and offensive *animus* as to show at once the intention, and the power, to commit it. So, drawing a sword or bayonet, or even holding up a fist in a menacing manner, throwing a bottle or glass with intent to wound or strike, presenting a gun at a person who is within the distance to which the gun will carry, pointing a pitchfork at a person who is within reach, or any other similar act, accompanied with such circumstances as denote at the time an intention, coupled with a present ability, of using actual violence against the person of another, will amount to an assault.—Russell on *Crimes and Misdemeanors*, vol. i. p. 750. It has even been laid down, that to present a pistol, purporting to be loaded, so near as to produce danger to life if the pistol had gone off, is an assault in point of law, although, in fact, the pistol was not loaded.

But no *words*, however provoking or irritating, can amount to an assault. On the other hand, the injury need not be effected directly with the hand of the person making the assault. Thus, there may be an assault by encouraging a dog to bite, by riding over a person with a horse, or by willfully and violently driving a cart, etc., against the carriage of another person. Nor is it necessary that the assault should be immediate, as where a defendant threw a lighted squib into a market-place, which, being tossed from hand to hand by different persons, at last hit the plaintiff in the face, and put out his eye, it was adjudged that this was actionable. And the same has been held where a person wantonly pushed a drunken man against another, and thereby hurt him. A defendant put some cantharides into coffee, in order that a female might take it; and she did take it, and was made ill by it; and this was held to be an assault. It is also an assault, willfully and of malice, to expose another to the inclemency of the weather; so is the taking indecent liberties with females without their consent, although they did not actually resist; and to such indecent liberties a very wide application has been given, even to the extent of holding a medical practitioner guilty of assault, who stripped a young girl of her clothes, on the pretense that he could not otherwise judge of her illness. Philanthropists and benevolent people will likewise be glad to be told, that not only does the striking that takes place at a *prize-fight* constitute an assault as between the combatants themselves, but all persons present in concert and co-operation may be punished as aiders and abettors. Again, an assault may be committed by unlawfully imprisoning or detaining the person of another; and by such detention is meant every confinement of the person, whether it be in a common prison or in a private house, or by a forcible detaining in the public streets. Numerous other cases could be stated, showing how nicely and protectively the law on this subject has been elucidated; but the explanation we have given is sufficient for its popular illustration.

Generally, it may be laid down, that the essential thing is the *intention* with which the alleged act is done, so that no matter how violent or menacing the conduct of the accused may have appeared to be, nor even how serious the injury, if it can be shown that the whole was unintentional or accidental and undesigned, there is no assault. It remains to be added on the subject of common assaults, that the party injured may proceed against the defendant summarily or by action or indictment for the same assault; but the court in which the action is brought will not compel him to make his election to pursue either the one or the other. Yet if the party has obtained a conviction before justices of the peace, this will be a bar to any other remedy, civil or criminal; and if the justices grant a certificate that it was not proved, or was trifling, this also, as must be quite apparent, will be a bar.

With respect to *aggravated* assaults, their special character arises from the great criminality of the object intended to be effected. Thus, attempts to murder, or to do great bodily harm, to ravish, and to obstruct officers of the law in the execution of legal process, are all of the nature of aggravated assaults; as are also attempts to commit robbery or any other felony. The remedy for an aggravated assault is usually by indictment, but justices of the peace may also, at least in the first instance, decide some cases. In certain cases the punishment is regulated by recent statutes: thus, by the 24 and 25 Vict. cc. 96, 100, it is enacted that persons unlawfully and maliciously starving an

apprentice or servant, whereby the life of such person shall be endangered, or the health injured, shall be guilty of a misdemeanor, and on conviction may be imprisoned, with or without hard labor, for any term not exceeding two years; and where the offense shall be against a young person under the age of 16 years, and shall amount in point of law to a felony, or to an attempt to commit a felony, or to an assault with intent to commit a felony, the guardians of the union or parish, or, where there are no guardians, the overseers of the parish, are authorized and required to prosecute, the costs of the prosecution being paid out of the common fund of such union or parish. Again, by an act of 24 and 25 Vict. c. 100, it is declared expedient to make further provisions for the punishment of aggravated assaults, and it is therefore enacted that if any person shall unlawfully and maliciously inflict upon any other person, either with or without any weapon or instrument, any grievous bodily harm, or unlawfully and maliciously cut, stab, or wound any other person, every such offender shall be guilty of a misdemeanor, and being convicted thereof shall be liable to three years' penal servitude, or to be imprisoned, with or without hard labor, for a term of two years: provided, however, that nothing contained in the act shall be deemed or taken to repeal other enactments of the act, by which it is provided that if any person shall unlawfully and maliciously, by any means, wound any person, so as thereby to endanger the life of such person, or so as thereby to inflict upon such person any grievous bodily harm, every such offender, being convicted thereof, shall be liable to be sentenced to penal servitude for life, or for the term of three years, or to be imprisoned, with or without hard labor, in the common jail or house of correction, for any term not exceeding two years; and, if a male, to be once, twice, or thrice publicly or privately whipped, in addition to such imprisonment, if the court shall think fit. The only other enactment that it may be necessary to notice is one in the same statute of 24 and 25 Vict. c. 96, which provides that any person convicted of any indecent assault, or of any assault occasioning actual body harm, shall be liable to be imprisoned for any term now warranted by law, with hard labor during the whole or part of such imprisonment.

In Scotland, the principle of the law of assault, and of its aggravations, is very much the same as that above stated. In the Scotch system it is laid down that it is of the utmost importance in all cases of actual assault to ascertain who struck the first blow, and the party who receives it will be excused for retaliating, if he do not exceed the just and fair measure of resentment. There, too, the highest of all aggravations is the assault with intent to murder. It is also an aggravation that the assault has been committed in pursuance of an old grudge, and on a principle of revenge; where, also, the offense has been accompanied with an intent to compel a rise of wages, or to deter from working at a certain rate, or in pursuance of a combination entered into for these illegal purposes. Another aggravation of the offense in Scotland is its being committed by a child on its parent, by a husband on his wife, or by any person upon another within his own house, although the latter crime falls more strictly under the antiquated term of *hamesucken* (q.v.). The remedy in Scotland is, as in England, by civil action of damages, and by a criminal prosecution, both being maintainable, and the latter usually at the suit of the lord advocate, as public prosecutor; but the private injured party may prosecute criminally should the lord advocate decline to so. See, on the subject of this article generally, Russell *On Crimes and Misdemeanors*, in England, and Alison's *Principles of the Scotch Criminal Law*.

BEATING JUDGES, in the Scotch law, is the strange title of a strange offense, according to the enlightenment of the present age—namely, that of committing a personal assault on a judge. By the provisions of an old statute now in desuetude, an assault on a judge sitting in court is a capital offense.

BEATING THE BOUNDS is the popular expression in England for those periodical surveys or perambulations by which the ancient boundaries of parishes are preserved. The procedure, according to common custom, is in this wise: On Holy Thursday or Ascension day, the clergyman of the parish, with the parochial officers and other parishioners, followed by the boys of the parish school, headed by their master, go in procession to the different parish boundaries, which boundaries the boys strike with peeled willow-wands that they bear in their hands, and hence the expression beating the bounds. The correct legal term is *perambulation* (q.v.). See Brand's *Popular Antiquities*, vol. i. pp. 174, 175; Lyson's *Environs of London*, vol. ii. p. 146; Hone's *Every-day Book*, vol. i. p. 651; Steer's *Parish Law*, by Hodgson; and Toulmin Smith's *Parish Law*.

According to these and other old authorities, the beating was not confined to the above performance of the boys with their willow-wands; but where it was desired to preserve evidence of particular boundaries, the singular expedient was used of whipping the boys themselves on the spot, or one of them, who received a stated fee for the permitted castigation out of the parish funds—it being thought that the impression made on the memory of the whipped boy was calculated to have a beneficial effect on the preservation of his evidence. A similar ceremony appears anciently to have prevailed in Scotland, and for the same purpose. See lord Stair's *Institutes of the Scotch Law*, book iv., title 43, s. 7, where it is stated that the boys were "sharply whipped."

BEAT OF DRUM, in military matters, is a signal or instruction conveyed by a particular mode of drum-beating. It is an audible semaphore, a telegraph that speaks to

the ear instead of the eye. There are many varieties, known by the names of the general, the reveillé, the assembly, the foot-march, the grenadiers' march, the retreat, the taptoo or tattoo, the call to arms, the call to church, the pioneers' call, the sergeants' call, the drummers' call, the chamade, the rogue's march, the long roll, etc. Some of the same instructions or commands are also given by the bugle, and some by the trumpet.

BEA'TON, or **BE'THUNE**, DAVID, cardinal and primate of Scotland, a zealous opponent of the reformation in that country, descended from a celebrated French family, was a younger son of John Beaton of Balfour, Fifeshire. Born in 1494, he became, in Oct., 1511, a student at the university of St. Andrews, and afterwards studied theology and the canon and civil laws of Paris. Early entering the church, he was preferred by his uncle, James Beaton, archbishop of Glasgow, to the rectory of Campsie, Stirlingshire. His tact and general abilities recommended him to the duke of Albany, regent during the minority of James V., who, in 1519, appointed him resident for Scotland at the French court. In 1525, he took his seat in the Scots parliament as abbot of Arbroath; his uncle, on being translated two years before to the archbishopric of St. Andrews, having resigned to him that abbey, with the half of the rents. In 1528, B. was appointed lord privy seal, and is said to have been the adviser of James V., in instituting the college of justice or court of session in Scotland, the idea of which was suggested by the constitution of the parliament of Paris. B. subsequently became prothonotary public, and was twice sent ambassador to France, to negotiate James's two marriages—first, with the French king's daughter, princess Magdalene, who died six months after her nuptials; and secondly, with Mary, duchess of Longueville, daughter of the duke of Guise. The king's union with the latter he solemnized, in 1537, in the cathedral church of St. Andrews. During his residence at the French court, he was admitted to all the privileges of a French citizen, and appointed by Francis I. bishop of Mirepoix in Languedoc. After his return, he became coadjutor to his uncle in the see of St. Andrews, and on 28th Dec., 1538, on the recommendation of the king of France, was, by pope Paul III., elevated to the dignity of a cardinal. On his uncle's death, in 1539, he succeeded him as archbishop of St. Andrews and primate of Scotland, and soon commenced a furious persecution of the reformers, already numerous and increasing. That he might be invested with supreme authority in all matters ecclesiastical, he obtained from the pope the appointment of *legatus a latere* in Scotland, and induced the king to institute a court of inquisition, to inquire after heretics in all parts of the kingdom. To maintain the French influence, and prevent all danger to the Roman Catholic church in Scotland by a friendly connection with England, he contrived to frustrate a proposed meeting of king James with his uncle, Henry VIII., and even prevailed on the former to declare war against his royal relative. On the death of James, after the disastrous overthrow of the Scots at Solway Moss, Dec. 14, 1542, B. produced a forged will of the late king, appointing himself, with three others, regents of the kingdom during the minority of the infant queen Mary. The nobility, however, rejected the fictitious document; and elected the earl of Arran regent, who then professed the reformed faith. The following month, B. was arrested and imprisoned, accused, among other charges, of a design to introduce French troops into Scotland, in order to stop the negotiations then in progress with Henry of England for a marriage between the young prince of Wales, afterwards Edward VI., and the infant queen of Scots. He was soon after liberated, and reconciled to the regent, whom he induced to abandon the English interest, and publicly to abjure the reformed religion. On the young queen's coronation in 1543, B. was again admitted of the council, and appointed chancellor. He now renewed his persecution of the reformers; and, in Jan., 1546, accompanied by the regent, he made a diocesan visitation of the counties under his jurisdiction, and punished with the utmost severity all the Protestants he could find. At Perth, a number of persons, accused of heresy, were banished the city, others were imprisoned; three men were cruelly hanged, and one woman drowned, by his directions. During a provincial council of the clergy held at Edinburgh, at which he presided, he caused the celebrated evangelical preacher, George Wishart, to be apprehended, and conveyed to the castle of St. Andrews, where he was burnt at the stake, B. and other prelates witnessing his sufferings from a window. A conspiracy having been formed against him, at the head of which were Norman Leslie and his brother, B. was assassinated in his own castle of St. Andrews, 29th May, 1546. Though endowed with great talents, B. possessed little learning. He is said, however, to have written *Memoirs of his Own Embassies;* a treatise on *St. Peter's Supremacy;* and *Letters to Several Persons*, of which Dempster observes there are several copies extant in the imperial library at Paris. Haughty, cruel, and intolerant, he was also licentious in the extreme. He had six natural children, three sons and three daughters—the latter married into families of distinction. One of his sons became a Protestant. His death was scarcely lamented by any party in the state.

BEATRI'CE PORTINA'RI, Dante's poetical idol; daughter of a Florentine noble, remarkably graceful and accomplished. Dante first saw her when she was but nine years old, and but seldom afterwards; but in his vivid imagination she grew to be the

personification of divine truth, and so appears in the *Divine Comedy*. In 1287, she married a citizen of Florence.

BEATTIE, JAMES, poet and moral philosopher, was b. 25th Oct., 1735, at Laurencekirk, Kincardineshire, Scotland. He studied at Marischal college, Aberdeen, where he acquired a high reputation as a classical scholar. In 1758, he was appointed one of the masters of the grammar-school in that city, and in 1760, professor of moral philosophy in Marischal college. Ten years afterwards appeared B.'s famous *Essay on Truth*, which met with most extravagant success. It was intended as an antidote to Hume, whose penetrating skepticism had found its way into all the enlightened circles of Scotland, and alarmed the friends of revealed religion. Drs. Reid and Campbell had previously attempted to refute the skepticism of the great historian, but, in the opinion of many, too deferentially. B., whose nature was poetically vehement, and whose zeal was consequently very ardent, assaulted Hume more violently, if not more powerfully, than his predecessors. The author himself naturally shared the popularity of his essay. He was introduced to George III., and solicited by dignitaries of the English church to take orders; high preferments were also promised, which, however, he magnanimously refused, shrinking with delicacy from doing anything which might give his adversaries a chance of saying that he had written on behalf of religion for hire. It was thought for a time that B. had demonstrated "the immutability of truth," and exposed the "sophistry of skepticism;" but if we may judge from the neglect which has overtaken his treatise during the last fifty years, his achievements had been overestimated. B. was deficient in logical acumen and in extent of philosophic erudition, but his poetical fancy, pure enthusiasm, and pious intentions, recommended the essay to multitudes. In 1771, appeared the first part of *The Minstrel*, and in 1774, the second part. It is a delightful poem. Time has dealt gently with it, for it still retains the freshness of its youth. It overflows with a sweet poetic emotion, and is rich in picturesque descriptions, while the versification has a quiet fullness of melody. The author's gentle yet fervent spirit beats in every line. The poem describes "the progress of a poetical genius born in a rude age, from the first dawning of fancy and reason, till that period at which he may be supposed capable of appearing in the world as a minstrel." B. intended to have added a third part, but circumstances hindered him. In 1776, he published a series of essays on *Poetry, Music*, etc.; in 1783, *Dissertations Moral and Critical;* in 1786, *The Evidences of the Christian Religion briefly and plainly stated;* and in 1790–93, *The Elements of Moral Science;* all of which works are written in a clear and elegant style, and with a high appreciation of whatever is beautiful and good. He died Aug. 18, 1803. His life has been written by his friend, sir William Forbes.

BEAUCAIRE, a well-built commercial t. of France, situated on the right bank of the Rhone, in the department of Gard, opposite Tarascon, with which it is connected by a magnificent suspension bridge. Pop. '76, 7956. The harbor is commodious for vessels, which enter it by a canal communicating with the Mediterranean, and avoiding the sand-banks at the mouths of the Rhone. The main feature of B. is its great fair, established, it is said, as early as the 12th century. It is held annually, beginning 22d July, and lasting six days. In former times, when this fair was free from duties, it was attended by merchants and manufacturers from almost all parts of Europe, from the Levant, and even from Persia and Armenia; and as the small town could not contain the vast concourse of traders, thousands of wooden huts and of tents were erected in the neighboring valley. But the numerous imposts demanded since 1632, foreign wars, and the competition of Marseilles, Lyons, and other large places, reduced the traffic of B., which sank still lower in the days of the revolution. The fair, however, is still held in much repute, the number attending it being estimated at 50,000, and the amount of property changing hands at £1,200,000. The chief articles of commerce are silks, wines, oil, almonds, and other fruits, spices, drugs, leather, wool, and cotton. B. appears to have been known in ancient times as Ugernum, which, in the 7th c., was a place of importance in a military point of view.

BEAUCE, a co. in Canada, province of Quebec, on the Maine border; 1100 sq.m.; pop. '71, 27,253; traversed by Chaudiere river. Chief t., St. Joseph.

BEAUCHAMP, ALPHONSE DE, a French historian and publicist, b. at Monaco, 1767; d. in Paris, June 4, 1832. He received his education in Paris, and entered the Sardinian military service. At the outbreak of the war with France, he refused to bear arms against his country, and obtained his discharge; but being suspected of treasonable designs, he was imprisoned for some months. After his liberation, he returned to Paris, where he took part against Robespierre; and on the establishment of the directory, obtained a situation in the office of the minister of police, and had the surveillance of the press. Here he commenced his *Histoire de la Vendée et des Chouans* (3 vols., Par. 1806; 4th ed., 1820), for which Fouché supplied the materials. As this work displeased the emperor, B. was banished to Rheims, but was recalled in 1811, and again received a subordinate appointment (on condition that he should publish nothing concerning his political contemporaries), which he lost in 1814. Under the restoration, he received a pension (1820), and wrote for the *Moniteur*, the *Gazette de France*, and the *Biographie des Hommes Vivants*, edited by Michaud. The numerous historical writings of B. are interesting, but bear the impress of party-spirit; but in his *Histoire du Brésil*

(Par. 1815), and *Histoire de la Conquête du Pérou* (Par. 1807), he found no opportunity of expressing his political partialities. Among his other works may be mentioned the *Histoire de la Campagne de* 1814-15 (2 vols., Par. 1818), the *Histoire de la Révolution du Piemont*, directed against De la Rosa (Par. 1823), and *Vie de Louis XVIII.* (Par. 1825). After the July revolution, he was employed on several legitimist journals; and the supposititious *Mémoires* of Fouché (4 vols., Par. 1828–29) have, with good reason, been ascribed to Beauchamp.

BEAUFORT, an inland district of the w. division of the cape Colony, divided into 9 field-cornetcies. It is chiefly used for pasturage, its oxen being, in seasons of abundant rain, decidedly the fattest in the colony. Its area is about 13,050 sq.m.; and its pop. is nearly 6000. Its capital, of the same name, is on the Gamka, being 363 m. to the e. of Cape Town, and 144 to the w. of Graaffreinet.

BEAUFORT, Cardinal, and bishop of Winchester (b. about 1370), was a natural son of John of Gaunt, duke of Lancaster, and was half-brother to king Henry IV. He was educated in England and Germany, and in 1404 became bishop of Winchester. He repeatedly filled the office of lord chancellor, and was involved in all the most important political movements of his times. He was present at the council of Constance, and voted for the election of pope Martin V., by whom he was subsequently made a cardinal. When the cardinal's nephew, Henry V. of England, proposed to levy a new impost on the clergy, in order to raise money for carrying on the war against France, B. was the chief opponent of the measure; but nevertheless he lent the monarch, out of his own private purse, £28,000—an almost incredibly large sum in those days, and one which justifies the belief that he was the wealthiest subject of his time in all England. His service in this affair was soon recognized by the pope, who sent him as legate into Germany, there to organize a crusade against the followers of John Huss. This undertaking failed; and the cardinal, having expended, in levying an English army against France, the moneys granted from Rome for other purposes, now fell under papal displeasure. In 1431, B. conducted the young king, Henry VI., to France, to be crowned in Paris as king of France and England. Here he also endeavored, but vainly, to reconcile the duke of Bedford, regent of France, with the offended duke of Burgundy. Cardinal B. died at Winchester in 1447. His memory is stained by his suspected participation in the murder of his great political rival, the duke of Gloucester, who headed the lay opposition to the despotism of ecclesiastical statesmen; and by the fact that he presided over the tribunal which sentenced the maid of Orleans to perish at the stake.

BEAUFORT, a co. in e. North Carolina, on Pamlico river and sound; 1000 sq.m.; pop. '80, 17,471—7,362 colored. It has a level, sandy, and marshy surface; products, tar, turpentine, corn, sweet potatoes, rice, etc. Co. seat, Washington.

BEAUFORT, a co. in s.e. South Carolina, on the sea-coast and the Savannah river; 1540 sq.m.; pop. '80, 30,190—27,752 colored. Productions, corn, rice, sweet potatoes, and Sea island cotton. Co. seat, Beaufort.

BEAUFORT, a t. and port of entry, the seat of justice of Carteret co., N. C., at the mouth of Newport river, 11 m. n.w. of cape Lookout; reached by the Atlantic and North Carolina railroad; pop. '70, 2340—1243 colored. There is a good harbor, the entrance to which is protected by fort Macon. The principal trade is in tar and turpentine.

BEAUFORT, a t. and port of entry in Beaufort co., S. C., on Port Royal island and Broad river, 14 m. from the ocean; pop. '80, 2,549—1273 colored. It is at the terminus of the Port Royal railroad; it has a good harbor, and is a popular summer resort.

BEAUFORT, Sir FRANCIS, 1774–1857. He served in the British navy, and was in the fight off Brest in 1794; commodore in 1800, and wounded in the fight near Malaga. He traveled in the east, and wrote a description of his route; in 1812, was wounded in a conflict with Turkish pirates, and returned to England; became rear-admiral in 1846. He contributed much to the science of geography, hydrography, etc., and was a member of most of the English learned societies.

BEAUFORT, FRANÇOIS DE VENDÔME, Duc de, 1616-69; grandson of Henry IV. of France; served in the thirty years' war; conspired with Cinq-Mars against Richelieu, and fled for safety. Under Louis XIV. he was in a conspiracy against Mazarin, and was imprisoned. He escaped in 1648, became a leader of the frondeurs, and was called by the Parisian populace "king of the markets." He killed the duke of Nemours, his brother-in-law, in a duel; afterwards made his peace with the court, and was appointed to command the navy. In 1664, he defeated the African corsairs; in 1666, led the fleet which was to aid the Dutch against England; in 1669, he assisted the Venetians, who were besieged by the Turks in Candia, and was there killed in a sally.

BEAUFORT, MARGARET, 1441–1509; countess of Richmond and Derby, daughter of the duke of Somerset, wife of the earl of Richmond (half-brother of Henry VI.) and by him mother of Henry VII. of England. She was afterwards wife of Sir Henry Stafford, and of Thomas, lord Stanley. She endowed Christ's and St. John's colleges in Cam-

bridge, establishing a divinity school in each, but Henry VIII. recovered the property as her heir. She translated some devout works from the French.

BEAUGENCY, an ancient t. of France, in the department Loiret, and situated on the right bank of the Loire, 15 m. s.w. of Orleans. B. was at one time surrounded by walls, flanked with towers and bastions, and defended by a strong castle, now ruined. In the history of the wars of France, B. occupies a conspicuous place. It was successively in the hands of the Huns, Saxons, Normans, and English, but it sustained most damage during the religious wars of the 16th century. B. manufactures woolens, leather, etc., and has a trade in wine, wool, and corn. Pop. '76, 3901.

BEAUHARNAIS, ALEXANDRE, Vicomte de, b. 1760, in the island of Martinique, served, under Marshal Rochambeau, in the American war of independence. Afterwards, he went to France, but though well received by the French court, he embraced the popular cause. Elected deputy to the states-general by the nobility and the justiciary authorities of Blois, he was among the first of his order to fraternize with the *Tiers Etat*, or democratic party. On the night of Aug. 4, 1789, he voted for the abolition of all privileges, and the political equality of all citizens. As a reward for his constancy to the cause of liberty, he was named secretary of the national assembly, and subsequently member of the military committee, but lost his popularity considerably by venturing to praise and defend the conduct of gen. Bouillé in the sanguinary suppression of the insurrection at Nancy. The manner in which he received the news of the flight of Louis XVI. exhibits a curious mixture of contempt and dignity. "Gentlemen," said he to the assembly over which he presided, "the king has just gone off; let us pass to the order of the day." In 1793, he declined the office of minister at war, and tendered his resignation as gen. of the army of the Rhine, because it had been determined to exclude the nobility from the service. During the reign of terror, his enemies revived the report that he had participated in the surrender of Mentz, because he had remained idle with his troops for 15 days. In consequence of this accusation, he was called from his country residence at Ferté Imbault to Paris, where he was tried and sentenced to death by the revolutionary tribunal. He submitted to his fate with firmness, and died on the scaffold, July 23, 1794, aged 34 years. His widow, Josephine, married Napoleon Bonaparte, who adopted Eugène and Hortensia, son and daughter of Beauharnais. Hortensia was married to Louis Bonaparte, king of Holland, and became the mother of the late emperor of the French.

BEAUHARNAIS, EUGÈNE DE, Viceroy of Italy during the reign of Napoleon I., and afterwards duke of Leuchtenberg, and prince of Eichstadt, was b. Sept. 3, 1781, and was the son of the viscount Beauharnais. After his mother's marriage with Bonaparte, he accompanied him in his campaigns in Italy, and in the expedition to Egypt. He rapidly rose to the highest military rank; and in 1805, after the erection of the imperial throne, he was made a prince of France and viceroy of Italy. In 1806, he married the princess Amalie Augusta of Bavaria, and not long afterwards was created prince of Venice, and declared by Napoleon his adoptive son, and heir of the kingdom of Italy. Although his political power was much limited, he conducted himself in Italy with much prudence, energy, and moderation, and in all the various scenes of his life maintained an honorable and virtuous character. It is to be regretted, however, that he considered himself so entirely a vassal of Napoleon, and bound to carry out the often harsh decrees of the latter in regard to Italy. His military talents were great, and were displayed particularly in the Italian campaigns, in the wars against Austria, and in the retreat from Moscow, in which the preservation of the French army from total destruction was very much to be ascribed to the skill and resolution of the viceroy and of Ney. The victory of Lützen was decided by his conduct in that battle. Napoleon sent him from Dresden to Italy, which he ably defended, even after Austria had joined the coalition, and Murat had deserted the cause of the French empire. After the fall of Napoleon, he entered into a convention with count Bellegarde. In the affairs of the Hundred Days, he took no part; and in the treaty of Fontainebleau and congress of Vienna, he was allowed to retain his possessions in the March of Ancona; and large sums were granted to him in compensation for his other Italian possessions, with which he purchased from his father-in-law the landgraviate of Leuchtenberg and principality of Eichstadt, and took his place as duke of Leuchtenberg among the nobles of Bavaria. He d. at Munich on the 21st of Feb., 1824.—His eldest son, Charles Augustus Napoleon, duke of Leuchtenberg, married the queen Donna Maria of Portugal on the 25th of Jan., 1835, but d. on the 25th of Mar. in the same year.—Another son, Max Eugène Joseph Napoleon, who succeeded his brother as duke of Leuchtenberg, married the grand duchess Maria Nikolajewna, a daughter of the emperor Nicholas of Russia; and his children bear the name of Romanowski, and are ranked among the members of the Russian imperial family. He d. 1st Nov., 1852, of disease of the lungs, consequent upon a scientific tour in the Ural. He was a zealous mineralogist, and left large collections, which are preserved at St. Petersburg.

BEAUHARNAIS, HORTENSE EUGÉNIE. See BONAPARTE, *ante*.

BEAUHARNOIS, a co. in the province of Quebec, Canada, on the St. Lawrence, and including Grand island; 200 sq. m.; pop. '71, 14,759. Chief town, Beauharnois, 18 m. s.w. of Montreal.

BEAUMANOIR, PHILIPPE DE, d. 1296; a French writer on law. In 1273, he was *bailli* at Senlis, and in 1280 held a similar office at Clermont. His chief work, *Coutumes de Beauvoisis* is highly commended by Montesquieu.

BEAUMARCHAIS, PIERRE AUGUSTIN CARON DE, a French poet, b. in Paris, Jan. 24, 1732, d. May 17, 1799, was the son of a watchmaker, and was brought up to his father's trade. He soon displayed a remarkable taste for music, attained proficiency as a player on the harp and the guitar, and was appointed music-master to the daughters of Louis XV. This was the beginning of his course of good-fortune. He acquired considerable property by marriage, and to dignify the somewhat ambiguous position in which his calling placed him, he devoted his talents to literature. His first play, *Eugenie* (1767), was successful, and was followed by *Les Deux Amis* (1770). Having become involved in lawsuits with Lablache and Götzman, he revenged himself on the latter—who was a member of the so-called *Parlament Maupeou*—by publishing his famous *Mémoires* (Paris, 1774), which united the bitterest satire with the sharpest logic, and gained for him a reputation that made even Voltaire uneasy, who could not bear a rival in his own department. Despite his wit, however, he lost his suit. His fame now rests on his two comedies, *Le Barbier de Seville* (1775), and *Le Mariage de Figaro*. Of his later works, we may mention *Mes Six Epoques*, in which he describes the perils through which he had passed in the first period of the revolution. During the American war of independence, he entered into a speculation for supplying arms, etc., by which he realized a considerable profit, but was a great loser by his expensive edition of Voltaire's works, and other speculations. The desire of gain and love of distinction were the leading motives which actuated B. His literary merits have been differently estimated. The most judicious critic of his writings and character is M. de Loménie, whose *B. and his Times* is full of interesting literary anecdote. An edition of B. was published at Paris in 1809.

BEAUMA'RIS, a seaport and chief t. of Anglesea, North Wales, is situated on the w. side of the picturesque bay of B., near the n. entrance to the Menai strait, 3 m. n. of Bangor, and 239 m. n.w. of London. B. has the ivy-covered remains of a castle, erected by Edward I., and a free grammar-school, and is a favorite sea-bathing resort. The bay is a safe anchorage in stormy weather. B. unites with Amlwch, Holyhead, and Llangefin in sending one member to parliament. It exports copper and other ores, slates, marble, etc. Pop. '71, 2291. The vessels which entered this port in 1875 numbered 2209, of tonnage 528,447; which cleared it, 2060, of 477,490 tons.

BEAUMONT, a t. in the department of Ardennes, France, on the Meuse, 10 m. s.e. of Sedan; pop, estimated, 1400. In the neighborhood, Aug. 30, 1870, the French under Marshal MacMahon were defeated by the Germans under the crown prince of Saxony, who gained by the battle such advantages as compelled the immediate surrender of Sedan.

BEAUMONT, FRANCIS, poet and dramatist; **FLETCHER,** JOHN, poet and dramatist. These writers were so closely associated in their lives and labors, that their names have become indissolubly united.—Francis Beaumont, the third son of sir Francis Beaumont, one of the justices of the common pleas, was b. at Gracedieu, in Leicestershire, in 1586, ten years after Fletcher; and d. in 1615, ten years before him. When 10 years of age, he became a gentleman-commoner of Broadgate hall (now Pembroke hall), and in 1600 was admitted a member of the Inner Temple. Two years thereafter, he published certain translations from Ovid. When about 19 years of age, he became the friend of Ben Jonson, and wrote commendatory verses to some of his dramas. At the theater, which attracted to its service most of the intellect and wit of the time, he became acquainted with Fletcher, and drawn together, they lived in the same house till B.'s marriage in 1613. He married Ursula, daughter and coheir of Henry Isley of Sundridge in Kent, by whom he had two daughters. He died at the early age of 30, and was interred in Westminster abbey. Poetry seems to have run in the blood of the Beaumonts. Several members of B.'s immediate family wrote verses, and the elder brother of the dramatist, sir John Beaumont, is said by the critics to have much improved our rhyme couplet.

John Fletcher was b. in 1576. His father was a clergyman, and appears to have inherited many of the honors of the church. He was for some time incumbent of Rye, in Sussex; thereafter, he was appointed dean of Peterborough, and is said to have attended queen Mary on the scaffold, and to have embittered her last hours with irrelevant exhortation. On his elevation to the see of London, he married a second time, and thereby procured the disfavor of the virgin queen. He died shortly after—of a queen's frown, as some maintain; others say, of the immoderate use of tobacco. John F. entered Bennet college, Cambridge, on the 15th Oct., 1591, where he acquired some reputation for classical erudition. It is uncertain how long he remained at the university, or whether he took a degree. The *Woman-hater*, produced in 1606-07, is the earliest play of his which is known to exist. It is not known precisely in what circumstances F. passed his life. He asserts his independence in some verses introductory to *The Faithful Shepherdess*, published about 1610, yet he wrote more rapidly than most men then writing for bread. The last four years of his life produced eleven new plays—a swiftness surpassing that of Shakespeare himself. Tarrying in London, it is said, for a

suit of new clothes, he caught the plague, and died. His death occurred in 1625, and he was buried in the church of St. Saviour's. F. also could boast of poetic descent and connection. Dr. Giles Fletcher, the bishop's younger brother, has been called "an excellent poet;" and two sons of his, Giles and Phineas, distinguished themselves by their verses. The one wrote *Christ's Victory and Triumph;* the other, *The Purple Island.*

The works of B. and F. comprise in all 52 plays, a masque, and several minor poems; but it is difficult to allocate, in any satisfactory manner, the authorship of these. F., being the longer lived and more prolific writer, of course contributed the largest share. Rowley assisted F. in *The Maid of the Mill.* Some critics think that the hand of Shakespeare may be detected in *The Two Noble Kinsmen,* and not without some show of reason. There is a tone of music and a step of thunder in some of the passages to which no parallel could be found in any of the companion-dramas. Two plays left unfinished at F.'s death were completed by Shirley. Out of the 52 plays, B. is supposed to have had a share in the composition of 17, and only 3 out of that small number were, during F.'s lifetime, published as joint productions. Two of these—*Philaster* and *The Maid's Tragedy*—are, with the exception of the great passages in *The Two Noble Kinsmen,* the glory of the collection. The question has been often discussed, why these plays are called by the name of B. and F., thus giving precedence to the younger and less voluminous writer. Mr. Dyce thinks, that of the three plays published as joint productions during F.'s life, B. had either the greater share, or that, through feelings of natural courtesy, F. placed the name of his deceased associate before his own, and that future editors naturally followed the arrangement which they found to their hand. Mr. Darling is inclined to give no reason at all, and ascribes the whole thing to accident. From all that can be gathered, it would appear that B. possessed the deeper and more thoughtful genius; F., the gayer and more idyllic. There is a strength as of granite rock in *The Maid's Tragedy;* there is a glad exuberant music, and a May-morning light and freshness in *The Faithful Shepherdess,* which Milton did not disdain to accept as a model in the lyrical portions of *Comus,* and of which the *Endymion* of Keats is but an echo. In these plays, B. and F. are the cleverest, gayest gentlemen. They never sound the deep sea of passion; they disport themselves, dolphin-like, on its surface. They have no power of serious characterization, and their numerous creations are seldom consistent; but they say the most clever, pleasant, and glancing things. Morally, little can be said in their praise. No audience of the present day could sit out the representation of their purest plays. Some of the impurest are almost beyond conception, yet there is always an air of good-breeding about them, and the filth is handled in the most gentlemanly manner. It was a great intellectual period in which B. and F. lived; but Shakespeare stands above them and the rest of that dramatic brotherhood like Mont Blanc above the summits of the lower Alps—conspicuous not only from his altitude, but from his purity.

BEAUMONT, GUSTAVE DE, a distinguished French publicist, b Feb. 6, 1802, at Beaumont-la-Chartre, in the department of Sarthe. He studied law, and was made procurator-substitute in the superior tribunal of the Seine, but lost this office after the July revolution. In 1831, B. and Tocqueville were commissioned by the French government to study the prison discipline of America. When B. returned to Paris, he received a place under government, but was soon deposed, as he refused to conduct the prosecution in the scandalous process against the Baroness de Feuchères. In 1840, he was elected deputy for the department Sarthe, and distinguished himself, as a member of the opposition, by his information and readiness on all political questions. After the Feb. revolution, 1848, he was returned as a member of the legislative assembly, and here maintained the character of a sincere but moderate republican. After the 2d Dec., 1851, he was arrested and imprisoned for some time in the fortress of mont Valérien. After regaining his liberty he lived in retirement, until his death in 1866. B. was the grandson of Lafayette, and in 1836 married his cousin, the daughter of Georges Lafayette. The writings on which B 's reputation is founded are *Note sur le Système Pénitentiare* (1831); *Du Système Pénitentiare ux Etats-Unis, et de son Application en France* (2 vols., 1832; partly by Tocqueville); *Marie, ou l'Esclavage aux Etats-Unis* (2 vols., 1835); and *L'Irlande, Sociale, Politique, et Religieuse* (2 vols., 1839).—BEAUMONT-VASSY, EDOUARD VICOMTE DE, a relation of the former, has acquired a reputation as the writer of *Une Marquise d'autrefois* (1838), and other romances, and some historical works, especially a *History of the European States since the Congress of Vienna* (vols. 1 to 6, Par. 1843–1853).

BEAUMONT (ELIE DE), JEAN BAPTISTE, late chief engineer and professor of geology in the school of mines at Paris, and in the *Collége de France,* was b. at Canon in 1798. He was distinguished not merely as a practical geological investigator, but also as a clear and acute speculator. The prevailing theory regarding the elevation of mountain systems was elaborated chiefly by him. His views as to the separate periods of elevation were published in several treatises. He was occupied for 23 years, in conjunction with Dufrénoy, in the preparation of a geological map of France, and its accompanying text. Among his writings are: *Coup d'Œil sur les Mines,* 1824; *Observations Géologiques sur les Différentes Formations dans le Système des Vosges,* 1829; *Recherches sur quelques-unes des Révolutions de la Surface du Globe,* 1835; and *Voyage Métallurgique en Angleterre* (2d ed., 1837–39). He died in 1874.

BEAUMONT, WILLIAM, 1796-1853; b. Conn.; a surgeon in the U. S. army, noted for discoveries in the processes and laws of digestion, made in watching the operations of the stomach in the case of Alexis St. Martin. On the 6th of June, 1822, St. Martin, then supposed to be 18 years old, while at Mackinac, Mich., was accidentally shot, receiving the entire charge of the musket in his left side, the muzzle of the gun being about three feet from his body. The discharge tore away portions of his clothing, fractured two of his ribs, lacerated his lungs, and lodged in his stomach. Dr. B., who was then stationed at Mackinac, restored St. Martin to good health within a year, renewing his former strength and spirits, though the aperture made by the shot was never closed. Two or three years afterwards, Dr. B. commenced a series of experiments upon the stomach of the *voyageur*, studying its operations and secretions, the action of the gastric juice, etc. These experiments he continued from time to time, his patient presenting the spectacle of a man enjoying good health, appetite, and spirits, with an opening in his stomach, through which the action of that organ could be satisfactorily noted from the exterior. Dr. B. was the first individual who obtained the gastric juice from a living human being, and he has demonstrated, beyond a doubt, its chemical properties and digestive powers. He published the result of his experiments in 1833. St. Martin was still living in Dec., 1879.

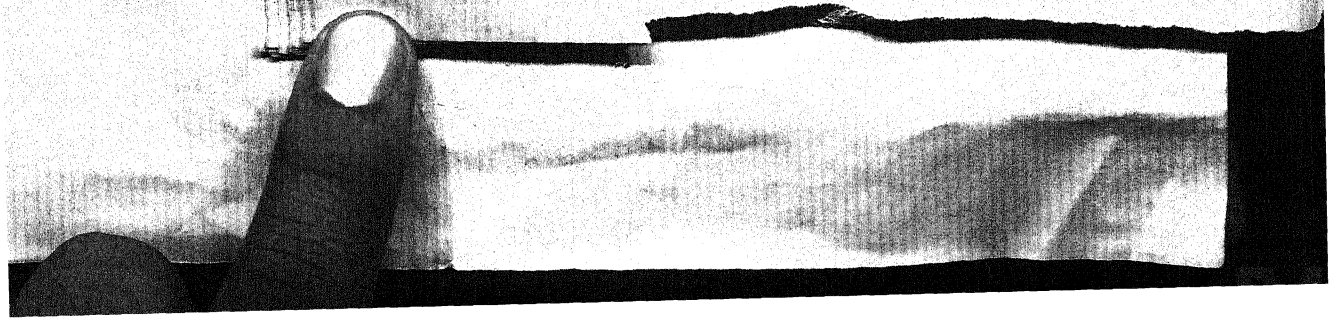
BEAUMONT DE LA BONNIÈRE, GUSTAVE AUGUSTE DE, 1802-66; a French advocate who in 1831 came to the United States with De Tocqueville to examine our penitentiary system, and with him published a book on the subject. Beaumont de la Bonnière also wrote *Marie, or Slavery in the United States*, a novel; and in 1839, *Ireland, Political, Social, and Religious*. In 1840, he was chosen to the chamber of deputies; in the constituent assembly of 1848 he was a member of the committee of foreign affairs, and Cavaignac sent him as minister to England. After 1851 he retired from politics. His wife was a granddaughter of Lafayette.

BEAUNE, capital of an arrondissement in the French department Côte d'Or, formerly included in the duchy of Burgundy, is situated in a pleasant district on the river Bouzeoise, about 23 m. s.s.w. of Dijon. The town is well built; has a fine parish church, Notre Dame, founded in 976 by duke Henri of Burgundy; and a splendid hospital, founded in 1443 by Nicholas Rollin, chancellor of Philip, duke of Burgundy. There are manufactories of serges, woolen cloth, and cutlery. A considerable trade is carried on in Burgundy and Champagne wines. B. gives its name to one of the best of the Burgundy wines. Pop. '76, 10,696.

BEAUNE, FLORIMOND, a distinguished mathematician, and friend of Descartes, was b. in 1601, at Blois, in France, where he d. in 1652. His labors and discoveries contributed greatly to the improvement of the modern analytical geometry first introduced by Descartes. Algebra was also enriched by B.'s showing that, in equations to the fourth degree, the limits of positive roots might be found from the coefficients. B. may be regarded as the proper founder of the integral calculus, as he first endeavored to deduce the nature of curved lines from the properties of their tangents. The so-called "Beaune's Problem" (which has been completely solved only by Jean Bernouilli), still given in the integral calculus, was for his time new and remarkable: it turns also on the determination of the nature of a curved line from a property of its tangent. The only work of his we possess is *De Æquationum Limitibus Opuscula duo, et Note Breves*.

BEAUREGARD, PETER GUSTAVE TOUSSAINT, a gen. of the army of the confederate states of America during the war of secession, was born of a family of Canadian French descent, on his father's plantation, near New Orleans, La., about 1817. He graduated at the military college of West Point in 1838; was appointed to the artillery, and transferred to the engineers; won his brevet of capt. at the battles of Contreras and Churubusco, in Mexico, and of major at Chepultapec, where he was twice wounded. After the Mexican war, he was engaged upon the fortifications on the coast of the gulf of Mexico, and was, for a few days in Feb., 1861, superintendent of the military academy at West Point. At the secession of Louisiana, he resigned, Feb. 20, 1861, and was appointed by the confederate government to the command at Charleston, S. C., where, April 11, he commenced the war by the bombardment of Fort Sumter (q.v.). July 21, he won the battle of Bull Run. March 5, 1862, he took command of the army of the Mississippi, under gen. A. S. Johnston, and on April 6, fought the battle of Shiloh—on the first day a victory, and on the second, when the federals had been reinforced, a partial defeat to the confederates, with the loss of gen. Johnston. After holding gen. Halleck in check for two months, he was obliged, by his failing health, to retire for a time from active service; but in 1863 defended Charleston; and in 1864, commanding at Petersburg, aided gen. Lee in the long and gallant defense of Richmond, the capture of which closed the war. He has since been president of the New Orleans and Mississippi railway; and in 1866, in the interests of the company, he visited New York, London, and Paris, being everywhere received with the highest distinction. He has also been in the service of the khedive of Egypt.

BEAUSOBRE, ISAAC DE, 1659-1738: a Protestant writer of French origin, ordained at the age of 22. Having broken the royal seal put upon a church door to prevent the reformers from exercising their religious rites therein, he was ordered to make the



amende honorable, but declined, and fled to Holland. He was afterwards chaplain to the king of Prussia. Among his works are a defense of the doctrines of the reformation; essays on providence, predestination, grace, and the eucharist; a translation of the New Testament with notes; a curious book on the Adamites of Bohemia; a criticism on Manicheism, and several dissertations on the *Bibliothèque Britannique*.

BEAUTEMPS-BEAUPRÉ, CHARLES FRANÇOIS, 1766–1854; b. France; hydrographer to the expedition sent in search of La Perouse. He made valuable charts of many of the places visited. In 1796, he completed his *Atlas of the Baltic*, and for several years afterwards he labored in connection with marine surveys, making many valuable charts. He became fellow of many scientific societies, and was in active duty in his profession nearly all his life. In England he has been styled "the father of hydrography."

BEAUTY. See ÆSTHETICS, ART.

BEAUVAIS, an important manufacturing French t., capital of the department Oise. It is situated in the valley of the Thérain (a tributary to the Oise), about 41 m. n.n.w. of Paris, and surrounded by rising woodlands. Formerly, B. was included in the old province, Ile de France. It is now the seat of government for the department, and the residence of a bishop, and contains a literary and economical society, a public library, a museum, etc. Among its several fine buildings, the most noteworthy is its uncompleted cathedral, the choir of which is the loftiest as well as one of the finest specimens of Gothic in France. The manufactures of B. include woolen cloths, shawls, carpets, Gobelin tapestry, etc. Pop. '76, 16,591. B. is an ancient town. It was included in the country of the powerful *Bellovaci*, in *Gallia Belgica*, and was known by the Romans as *Cæsaromagus*, afterwards as *Bellovacum*. In the middle ages, it was styled *Belvacum*. In 850, and at other times, B. was desolated by the Normans. The *Jacquerie*, or peasants' war, broke out in the neighborhood of B., Mar. 21, 1358. In 1443, B. was besieged by the English, who were repulsed by the heroic self-sacrifice of Jean Lignière. Again, in 1472, it was besieged by Charles the bold of Burgundy, with an army of 80,000 men, when the women of B., under the leadership of the heroine Jeanne Lainé, surnamed La Hachette for her daring, displayed remarkable valor. The standard which the Burgundians had planted on the wall was torn down by Jeanne Lainé, and borne off by her in triumph. The banner is preserved in the town hall, and a procession, in which it is carried by young girls, annually commemorates the heroic deed. B. is the birthplace of the learned Dominican Vincent de Beauvais (Vincentius Bellovacensis).

BEAVER, *Castor fiber*, a quadruped of the order *glires*, or *rodentia* (q.v.), valued for its fur, and for the peculiar substance called *castoreum* (q.v.), which it yields, and also much noted for its instincts. Some naturalists regard the American B. as distinct from that of Europe and Asia; but the differences observable either in external or anatomical characters are very inconsiderable; and the opinion that a great difference exists in instincts and habits, appears to have been too hastily adopted. If there is only one species of B., it is very widely distributed in the northern regions of the world, reaching in America almost as far s. as the gulf of Mexico. It once existed in the British islands, where, however, it has long been extinct; and it has become rare in Europe, in many parts of which it was once common. It has become rare also in the United States, disappearing before man; but is nowhere so abundant as in that wide region of lakes and rivers which lies to the n. and w. of the settled parts of North America. Considerable numbers of beavers are found on the banks of the Obi and other rivers of Siberia, and in Kamtchatka.

The incisors or cutting teeth of the B. are remarkably strong, and exhibit in the highest degree the distinctive character of the order to which it belongs—the front of hard enamel, which in the B. is of a bright orange color; the back of the tooth formed of a softer substance, more easily worn down, so that a sharp, chisel-like edge is always preserved; the bulbs being also persistent, so that the teeth are continually growing, as by their employment in gnawing wood they are continually being worn away. There are four flat molar teeth (or grinders) on each side in each jaw. Each foot has five toes: those of the fore-feet are short, and not connected by a web; those of the hind-feet are long, spreading out like the toes of a goose, and webbed to the nails. In accordance with this remarkable peculiarity, the B., in swimming, makes use of the hind-feet alone, the fore-feet remaining motionless and close to the body. Another character, to which nothing similar appears in any other rodent, is the large, horizontally flattened tail, which, except at the root, is not covered with hair, like the rest of the body, but with scales. The caudal vertebræ, however, do not exhibit a flattened form.

The B. is usually at least 2 ft. in length, from the nose to the root of the tail; the tail is of an oval form, about 10 in. in length, fully 3 in. in greatest breadth, and scarcely an inch in thickness. These dimensions are sometimes exceeded. The general form of the animal is thick and clumsy, thickest at the hips, and then narrowing abruptly, so that it seems to taper into the tail. The head is thick and broad, the nose obtuse, the eyes small, the ears short and rounded. The fur consists of two kinds of hair; the longer hair comparatively coarse, smooth, and glossy; the under coat dense, soft, and silky. The color is generally chestnut, rarely black, spotted, or nearly white.

The B. is very aquatic in its mode of life, and it seldom wanders far from some lake or river. In consequence of its habits, it is also limited to wooded districts, and the northern range of the species is everywhere terminated by the limits of the wood upon the river-banks.

The food of the B. consists of the bark of trees and shrubs (birch, poplar, willow, etc.), and of the roots of water-lilies (*nuphar luteum*) and other aquatic plants. In summer, it eats also berries, leaves, and various kinds of herbage. There is reason to think that it never, as has been supposed, kills or eats fish. Like some other rodents, it lays up stores of provisions for winter; but these, in the case of the B., consist chiefly of bark, or of branches, and even trunks of trees. Its extraordinary powers of gnawing are exerted to cut down trees of several inches in diameter, both for food, and for the construction of those houses and dams which have rendered it so much an object of admiration to mankind. A tree of 18 in. in diameter has been found thus cut down by beavers, although smaller ones are usually preferred; and when a tree of this size is cut, the branches only, and not the trunk, are employed in the architectural operations of the animals. These operations are very wonderful, although the statement, at one time commonly made, that beavers drive stakes into the ground, has no foundation in fact; and some of the other particulars which passed current along with it, were equally fabulous. The houses or lodges of beavers are grouped together near the edge of the water, the mud being scraped away from the front, so that there may be a sufficient depth of water there to allow free egress, even during the most severe frost. The winter stores of the animals, consisting of piles or heaps of wood, are also always under water, at such a depth that they cannot be locked up in ice. When the depth of water is not sufficient, the beavers construct a dam across the stream, by the side of which the lodge is placed; the dam is sometimes as much as 300 yards in length, convex towards the current, and most convex in the strongest currents, sometimes extending on both sides beyond the natural channel of the stream. The materials of which it is composed are sticks, roots, and branches, with stones, moss, grasses, and mud, strangely commingled, but in such a manner that the structure becomes absolutely water-tight. Branches of which the bark has been used for food, or taken off for winter provender, are very generally employed for building purposes. In their building, beavers interlace small branches with each other and with the larger; and a B. kept in confinement has been known to manifest this instinct, by interlacing branches with the bars of its cage, whilst it also filled the interstices with carrots, and other vegetables, given it for food, nicely bitten to the proper size, and packed in snow, to protect itself from the cold. B. dams are built with the sides inclining towards one another, so that although 10 or 12 ft. wide at bottom, they have a narrow top. The dams and houses are annually repaired, before winter comes on, the work being performed by night. "In places," says Hearne, "which have been long frequented by beavers undisturbed, their dams, by frequent repairing, become a solid bank, capable of resisting a great force, both of water and ice; and as the willow, poplar, and birch generally take root and shoot up, they by degrees form a kind of regular planted hedge, which I have seen in some places so tall that birds have built their nests among the branches." A broad ditch is often dug all around the lodge, so deep that it cannot freeze to the bottom, and into it the beavers make the holes by which they go out and bring their food. The larger lodges are in the interior, about 7 ft. in diameter, and between 2 and 3 ft. high. The top is formed of branches of trees, matted with mud, grass, moss, etc. The walls are very thick, and the whole structure not only secures much warmth, but is a sufficient protection from wolves, wolverines, and other beasts of prey. Different apartments have often one common roof, but they have usually no internal communication. The sleeping-places of the animals are around the wall of their lodge, the center being left free; they are formed merely of a little grass or tender bark of trees. A single house seldom contains more than ten or twelve beavers, but many such families are often congregated in one place. Beavers, both in a wild state and in confinement, are scrupulously cleanly in their habits.

Beavers often sit on the hind-feet and tail, and eat in this posture, holding up the food in their fore-paws. They also walk on the hind-feet, with support of the tail, when they carry materials to their buildings, except branches, which are dragged. They have considerable power in the tail, and not unfrequently flap it, which has given rise to an opinion, perhaps not altogether erroneous, that they use their tails for plastering their buildings, or beating and adjusting the mud which is employed in them.

Beavers do not usually eat in their lodges, but in holes or burrows in the bank of the river, the entrance to which is from beneath the water, and which thence proceed obliquely upwards, often to a distance of many feet. To these holes the beavers also flee when their lodge is broken up; and it is therefore a common practice of the B. hunters to break up the B. lodges, that they may take the animals in their holes or vaults. Beavers are also taken by nets and traps.

It is chiefly in winter that beavers congregate together. During summer, they wander about a little. The young are generally produced in April or May, from two to seven at a birth. Their eyes are open when they are born.

Single beavers are frequently met with, which live apart from all others of their

species. All of these are males, which, it is supposed, have been conquered and driven away by others of their sex.

In the parts of North America where beavers have now become rare, they live mostly in burrows in the river-banks, like those which are still found in Europe. Circumstances prevent them from following out their gregarious tendencies. That the beavers of Europe and Asia construct lodges and dams, when they have opportunity of congregating in sufficient numbers, appears to be no less certain than that those of America do so.

Large glandular pouches, two in number, closely connected with the organs of reproduction, contain the substance called *castoreum* (q.v.). Its uses in the animal economy are by no means well known; they are probably analogous to those of musk, civet, etc.; but its peculiar pungent odor is so attractive to beavers, that use is made of it as a bait for B. traps.

The B. is very easily tamed; but no wooden cage will keep one confined. Except in the extraordinary building instincts already noticed, the animal exhibits no remarkable sagacity.—The use of the B.'s fur for making hats is well known. See HAT. An act of the English parliament, in 1638, prohibiting the use of any other material for hat-making, contributed to the rapid diminution of the number of beavers in the parts of North America from which their skins were then obtained. During great part of the 18th and the earlier part of the 19th c., the number of B. skins annually exported from America appears to have been not less than 200,000. It is now greatly diminished, but is still large. The flesh of the B. is much esteemed as an article of food by trappers and others who frequent the fur-countries, but it is very oily.

Fossil remains of beavers, apparently of the same species with that now existing, are found in the deposits referred by geologists to the pliocene and pleistocene periods. Other remains are also found of a much larger animal of the B. kind, which must have existed in Europe and Asia along with the present species, but which seems to have become extinct before the historic period. They were different, however, not merely in size, but in other particulars so important, that Owen has constituted for the "great B." a distinct genus *trogontherium* (Gr., a chewing or gnawing beast).

Of existing animals, the most closely allied to the B. is the *coypu* (q.v.), sometimes called the Chilian B. (*myopotamus coypus*), which yields the fur called *racoonda* (q.v.).

BEAVER. See HELMET.

BEAVER, a co. in w. Pennsylvania, intersected by the Cleveland and Pittsburg, and the Pittsburg, Fort Wayne and Chicago railroads, 650 m. square. Pop. '80, 55,603. The soil is fertile; products, hay, grain, butter, cheese, etc.; and there are mines of coal and limestone. Co. seat, Beaver.

BEAVER, a co. in s. Utah on the Nevada border, drained by Beaver river; pop. '80, 3,918 A large portion is an arid plain with little water or timber; yet there is considerable agriculture. Iron ore is found. Co. seat, Beaver.

BEAVER DAM, a city in Dodge co., Wis., 61 m. n.w. of Milwaukee, on the Chicago, Milwaukee, and St. Paul railroad, at the outlet of Beaver lake; pop. '80, 3441. It is the market center of a fertile district, with factories, flour-mills, etc.

BEAVER FALLS, a village in Beaver co., Penn., on the Beaver river near its junction with the Ohio, 34 m. n.w. of Pittsburg; on the Pittsburg, Fort Wayne and Chicago, and the Erie and Pittsburg railroads; pop. 5000. There are many manufactories, nearly all of which are controlled by the "Harmony" society of economy.

BEAVER HEAD, a co. in s.w. Montana, on Jefferson river, about 4393 sq.m.; pop. '80, 2,712. The surface is rough. Stock-raising and mining are the main occupations. Co. seat, Bannack city.

BEAVER INDIANS, a tribe on Peace river, in British America, allied to the Chippewas.

BEAVER ISLANDS, in lake Michigan, w. of the straits of Mackinac, forming the co. of Manitou. A band of Mormons settled on the principal island in 1846, but did not long remain there. Chief town and co. seat, St. James.

BEAVERTAIL, in Narragansett bay, the s. extremity of Canonicut island. It has a light-house with fixed white light, 96 ft. above tide, and a fog-horn.

BEAVER WOOD. See MAGNOLIA.

BEBEERINE is one of the alkaloids, and is obtained from the greenheart bark or *bebeeru* of Demerara. It is used in medicine in place of quinine, which it resembles in properties, though it is not so powerful in its action as a tonic and febrifuge. The condition in which it is generally sent into market is as the sulphate of B., occurring in shining scales of a pretty brown color, and soluble in water.

BEBEERU, BEEBEE'RU, or BIBI'RI. See GREENHEART.

BECCAFI'CO, *Sylvia hortensis*, or *Curruca hortensis*, a little bird of the family of the *sylviadæ*, or warblers (q.v.), sometimes called the pettychaps, and sometimes the garden warbler, rather rare in Britain, but abundant in some of the more southern parts of Europe, and in great demand for the table in Italy, its flesh being regarded as of pecu-

liar delicacy. It is a mere summer bird of passage, however, not only in Britain, but even in the s. of Europe. The upper parts are mostly of a brown color, the lower parts whitish. It is a bird of very pleasing song. B. is an Italian name, and is sometimes extended to other birds of the same family used for the table.

BECCAFUMI, or MECHERINO, DOMENICO, b. about 1488, d. 1551; an Italian painter, the son of a peasant. Lorenzo Beccafumi, a rich nobleman, took the boy into his service, and fostered his natural taste for art, by sending him to study in Rome. B. painted many religious pieces for churches, and mythological works for private patrons. He also continued the wonderful pavement in the cathedral of Siena, his native place. For 150 years the best artists worked upon this pavement, which was of white marble, the subject being engraved in black outline, and the border inlaid with rich patterns of many colors. Beccafumi was occupied in this work 27 years. He also made a triumphal arch and an immense mechanical horse for the procession at the entry of Charles V. into Siena.

BECCAMOSCHINO, *Sylvia cisticola*, a little bird of the family of the warblers, found in Italy, and remarkable for its nest, which resembles that of the tailor-birds, being usually placed in a bush of lengthened herbage, the leaves and stalks drawn together over it, and a flooring formed for it by leaves curved across below, and sewed together generally with some kind of vegetable fibers.

BECCARIA, CESARE BONESANA, a political and philanthropic writer, was b. at Milan, 1735 or 1738. The opinions of the French encyclopædists, especially those of Montesquieu, had the greatest influence in the formation of his principles and sentiments. The work which most favorably exhibits the character and genius of Beccaria is his *Trattato dei Delitti e delle Pene* (Treatise on Crimes and Punishments), first published in 1764, in which he argues against the severities and abuses of criminal law, especially capital punishment and torture. The work was extremely popular, and was translated into several European languages. It is marked by eloquence, sensibility, and lively power of imagination. Kant unfairly accuses the author of an affected humanity, though it must be admitted that the German philosopher has exposed the invalidity of some of the arguments brought forward. On the whole, however, the work of Beccaria is acknowledged to have done great good, and the subsequent reforms in the penal code of European nations have generally taken the direction he has pointed out. He was among the first to advocate the beneficial influence of education in lessening crime. This naturally brought upon him the hatred of the priesthood, who, according to their usual formula of persecution, accused him of impiety; but their malice was frustrated by the efforts of count Firmian, the Austrian governor of Lombardy, a man of liberal and enlightened sentiments. In 1768, Beccaria was appointed professor of political philosophy at Milan, and achieved great success as a lecturer. He died of apoplexy in Nov., 1793. In the course of his life he published several works.

BECCARI'A, GIAMBATTISTA, or GIOVANNI BATTISTA, 1716–81; an Italian astronomer and electrician. He was professor of experimental physics at Palermo, Rome, and Turin. In 1775, he was elected a fellow of the royal society of London. In 1759, he was commissioned to measure an arc of the meridian in the neighborhood of Turin. His principal work was *Electricity, Artificial and Natural*.

BEC-FIN, the common French name for different species of birds of the family of *sylviadæ*, or warblers (q.v.). It is sometimes to be met with in English books.

BÊCHE-DE-MER, or TREPANG, an article of luxury among the Chinese, consisting of the dried bodies of several species of *holothuria* (q.v.), or sea-cucumber, which are found in great abundance in the shallow waters of lagoons, and on reefs, from the s.e. coasts of Asia to New Holland. The traffic in bêche-de-mer is very extensive, and the Malays catch the animals, and prepare them in large quantities for the Chinese market. They are usually about 8 or 9 in. long, but some are 2 ft. in length, and 7 or 8 in. in girth. They are often found nearly buried in the coral sand, their feathered tentacula alone floating above it. The larger ones are sometimes speared in shallow water; but most of them are taken by divers in depths of from 3 to 5 fathoms. An expert diver will bring up 8 or 10 at a time. They are split down one side, boiled, pressed flat with stones, dried in the sun, and afterwards in smoke, and packed in bags, in which state they are bought by the Chinese, and conveyed in junks to China. Fleets of Malay proas are employed in the search for this curious production of the sea. Macassar is the great staple-place of the trade, and from it above 8000 cwt. of bêche-de-mer are annually sent to China, the price varying according to the kind and quality, from 30s. to £10 per cwt. There is also a considerable export of bêche-de-mer from Manilla. Bêche-de-mer is extremely gelatinous, and is very much used by the Chinese as an ingredient in rich soups.

BECHER, JOHANN JOACHIM, author of the first theory of chemistry, was b. at Speier in 1625. In his youth he had many difficulties to contend with, but his zeal and perseverance overcame them all. He acquired an extensive knowledge of medicine, physics, chemistry, and even politics, and in 1660, was made a member of the imperial council at Vienna. While residing in this city, he assisted in establishing several manufactures, and drew up the plan of an East Indian commercial society, but unfortunately he fell into disgrace, and had to leave the city. He next went to Mainz, and subsequently

lived in Munich, Würzburg, Haarlem, and finally London, where he died in 1682. He had many enemies, and was accused—not altogether unjustly—of charlatanry. Nevertheless, he rendered important services to chemistry. His *Physica Subterranea* was the first attempt made to bring physics and chemistry into close relation; in these two he sought the causes of all the inorganic phenomena in the world. He at the same time began to construct a theory of chemistry, and also investigated the process of combustion. Becher taught that every metal was composed of an earthy substance common to all metals; of a combustible principle also identical in all; and was differentiated from other metals only by the possession of a peculiar mercurial element; when a metal was heated, until it had changed its form, the mercurial substance was discharged, and nothing remained except metallic calx. Herein lies the first germ of Stahl's phlogistic theory, which obtained universal currency until the time of Lavoisier.

BECHUANS. See BETJUANS.

BECK, JOHN BRODHEAD, 1794–1851; b. N. Y.; a graduate of Columbia college, and professor of materia medica in the New York college of physicians and surgeons. Among his works is *Infant Therapeutics.*

BECK, LEWIS C., 1798–1853; b. N. Y.; brother of John Brodhead; a graduate of Union college; professor of chemistry in Albany medical college; author of works on botany and chemistry, and of an elaborate report on the mineralogy of the state of New York.

BECK, THEODORIC ROMEYN, LL.D., 1791–1855; b. N. Y.; brother of John Brodhead; an American physician; he graduated at Union college, practiced in Albany, and in 1841 was professor of materia medica in the medical college of that city. He was author of *Elements of Medical Jurisprudence.*

BECK, or BEEK, DAVID, 1621–56; a Dutch painter, trained by Van Dyck; and acquiring many of that master's excellences. He was portrait painter and chamberlain to queen Christina of Sweden, with whom he was in high favor. For her gallery he made portraits of nearly all of the sovereigns of Europe.

BECKER, a co. in n.w. Minnesota, at the head of the Red river of the n.; intersected by the Northern Pacific railroad; 1400 sq.m.; pop. '75, 2256. The surface is about 1700 ft. above tide and dotted with lakes. The soil is generally good. Co. seat, Detroit city.

BECKER, GOTTFRIED WILHELM, a German author, b. at Leipsic in 1778, entered the university of that city with the view of studying medicine, and having taken his doctor's degree in 1801, settled there as a practicing physician and a writer of medical works, several of which reached many editions. The wars of the period led him, however, to turn his attention to history and modern languages, and he became well known by his contributions to periodicals, his series of popular histories, and his translations from the English, French, and Italian. In 1833, Becker entirely relinquished practicing medicine, and devoting himself to literature, became a fertile and admired contributor to many of its more popular branches. He died at Leipsic, 17th Jan., 1854. He published several attractive volumes of travels in his own country, peculiarly adapted to the young, among which we may instance his *Tour to the Harz, Sketches of Southern Germany,* etc. His historical writings, which are not less numerous, chiefly narrate the events of his own time. Amongst them we may particularize *Andreas Hofer, Egypt as it Now Is, The Fate of Spain in Modern Times,* etc. In light literature, also, he was very successful as a translator. All his works have been published at Leipsic.

BECKER, HERMAN HEINRICH, b. 1820; a German radical politician, whose extreme views led to his imprisonment for several years after 1848. He has since been a member of the Prussian house of deputies and of the North German parliament, and a leader on the liberal side.

BECKER, JOHN PHILIP, one of the most active radical politicians of late years, was b. Mar., 1809, at Frankenthal, in the Palatinate on the Rhine, and brought up as a brushmaker. The French revolution of July, 1830, gave a political bias to his tendencies, and he took part in the political agitations of the day, in consequence of which he was imprisoned; but in 1833 he was released, and exerted himself warmly on behalf of his brothers in opinion. In 1837, he settled in Switzerland, taking a part in several radical publications, and organizing in 1838 and 1845 volunteer corps. In the autumn of 1847, he was summoned to the military bureau at Berne, and being chosen adjutant of Ochsenbein's division, fought against the Sonderbund with acknowledged bravery. Upon the failure of Hecker's attempt to revolutionize Baden in 1848, Becker, who had organized troops for his support, returned to Switzerland, to plan an expedition of German and Swiss auxiliaries, to support the cause of freedom in Rome and Sicily. Their movements being frustrated, he led his troops in the summer of 1849 into the Palatinate and the duchy of Baden, where a rising had taken place, and acted a prominent part in many engagements. Subsequently, he settled in Geneva, and engaged successfully in commerce. A history of the revolution of 1849, in s. Germany, has been published by him and Esselen. Becker has lately been known as a leader of the socialist party, and is an active agitator on behalf of the association known as the "International."

BECKER, KARL FERDINAND, b. at Leipsic in 1804, may be named with Kiesewetter and Winterfeld, as one of the best German writers on the history of music, and also as an excellent composer for the organ, as is proved by his trios and other compositions well adapted to the genius of the instrument. Among his works may be mentioned: a *Choral-book*, or collection of psalm and hymn tunes (Leipsic, 1844); *Choral Melodies* for Spitta's Psalter and Harp, 1841; a *Catalogue* of his musical library, one of the most extensive in Germany; *On the Choral Collections of Various Christian Churches*, 1841; *The Choral Compositions of the 16th and 17th Centuries*, 1847; and *The Composers of the 19th Century*, 1849. He died Oct., 1877.

BECKER, KARL FERDINAND, one of the most distinguished German philologists, was b. at Liser, in the old electorate of Treves, in 1775. At first a teacher, he afterwards studied medicine, and ultimately settled as a practitioner at Offenbach. Here he educated his own children with such success that several families induced him to take charge of theirs, and thus his house was converted into an academy (1823), which he conducted till his death in 1849. This gave scope to his early predilection for linguistic studies, to which his scientific training led him to give a quite new direction. Becker contemplates language as an *organism*, pervaded by strict logical laws. From this point of view he wrote his *Deutsche Grammatik* (2d ed., 1870). He neglects too much the historical development of language, and thus, as might be expected, comes at times into conflict with the results of comparative philology; yet his work is valuable for its logical consequence, and for its leading idea of organism in language. Besides a *Schulgrammatik* (10th ed. 1872), which is an outline of his larger work, he published several other treatises on the German language.

BECKER, WILHELM ADOLF, a distinguished German author, was b. at Dresden in 1796. Originally intended for commercial life, he soon abandoned a pursuit which he found uncongenial to his tastes, and devoted his time to the acquisition of learning. In 1816, he came to Leipsic, where he studied theology, and more particularly philology. In 1840, he traveled through Italy; and in 1842, was appointed professor of archæology at the university of Leipsic, where his prelections on the Latin authors were numerously attended. He died at Meissen, 30th Sept., 1846. His lively fancy, aided by a thorough knowledge of the classic languages, enabled him to make quite a novel use of antiquity. In his *Charicles* (Leip. 1840), he ventured to reproduce the social life of old Greece; and in his *Gallus* (Leip. 1838), to give sketches of the Augustan age at Rome. The learning which he has contrived to stuff into his picturesque sentences is marvelous, not to speak of the quantity buried in his *excursus*, or disquisitions, which in the English translation of the works by Metcalfe, are transferred from the text to the end of the volumes. Lockhart's *Valerius* is the only thing in English literature which corresponds to these compositions of the German author. Becker's treatise, *De Comicis Romanorum Fabulis* (Leip. 1837), is a valuable contribution to the history of Roman dramatic poetry. His most important work, in a scholastic point of view, is his *Hand-book of Roman Antiquities* (1843–46), which, after his death, was continued by Marquardt.

BECKERATH, HERMANN VON, one of the most remarkable public characters of Germany, was born at Krefeld (in Prussia,) Dec., 1801. He sprang from a commercial family, and made a considerable fortune as a banker. But he gave himself also to pursuits of a more intellectual character, and especially to the studies of jurisprudence and politics. The accession of Frederick-William IV. to the throne roused B. to a sense of the political condition of his country, and he devoted himself to work out its constitutional freedom. In 1843, he was elected representative of his native town in the provincial diet, and continued for several years to take a prominent part in Prussian politics. He was a deputy in the national assembly which sprang up in the eventful year 1848, and held its sittings at Frankfort. His eloquence exercised considerable influence on this assembly. He was appointed minister of finance, and shortly after called to Berlin, to construct a cabinet; but in this he failed. His strictly constitutional advice was not apparently agreeable to the court, and he returned to Frankfort. An advocate for German unity, it was he who made use of the expression: "This waiting for Austria is death to the union of Germany." But he refused his assent to any revolutionary measure. When the retrograde movement set in, he resigned the posts he held under government, but continued, as a member of the second Prussian chamber, a vigorous opposition to the Manteuffel ministry, which had deserted the cause of German unity. He withdrew from the arena of political strife in 1852. After the return of Manteuffel to power, in 1858, B. was again elected a member of the Prussian second chamber: but he was obliged to decline the honor, on account of failing health. He devoted his later years to the affairs of Krefeld, his native town, where he died in May, 1870.

BECKET, THOMAS À., archbishop of Canterbury, was the son of a merchant, and was born in London in 1119. The story which makes his mother a Saracen is charmingly romantic, but there are doubts if it has any historical basis. He studied theology at Oxford and Paris, and afterwards law at Bologna, and at Auxerre, in Burgundy. Having been recommended to Henry II. by Theobald, archbishop of Canterbury, who had had experience of his abilities, B. was promoted to the office of high chancellor, and thus (according to Thierry) resuscitated the hopes of the English as the first native Englishman, since the Conquest, who had filled any high office. His duties as high chancellor

were numerous and burdensome, but he discharged them vigorously. He was magnificently liberal in his hospitality. Henry himself did not live in a more sumptuous manner. As yet, B. seems to have regarded himself as a mere layman, though, in point of fact, he was a deacon; but in 1162, when he was created archbishop of Canterbury (an office which, as it then involved the abbacy of the cathedral monastery, had never but twice before been held by any but a monk or canon-regular), a remarkable change became manifest in his whole deportment. He resigned the chancellorship, threw aside suddenly his luxurious and courtly habits, assumed an austere religious character, exhibited his liberality only in his "charities," and soon appeared as a zealous champion of the church against all aggressions by the king and the nobility. Several noblemen and laymen were excommunicated for their alienation of church property. Henry II., who, like all the Norman kings, endeavored to keep the clergy in subordination to the state, convoked the nobility with the clergy to a council in 1164 at Clarendon (near Salisbury), where the so-called "constitutions" (or laws relative to the respective powers of church and state) were adopted. To these, the primate, at first, declared he would never consent; but afterwards, through the efforts of the nobles, some of the bishops, and, finally, of the pope himself, he was induced to give his unwilling approbation. Henry now began to perceive that B.'s notions and his were utterly antagonistic, and clearly exhibited his hostility to the prelate, whereupon B. tried to leave the country. For this offense the king charged B. with breach of allegiance, in a parliament summoned at Northampton in 1164, confiscated his goods, and sequestered the revenues of his see. A claim was also made on him for not less than 44,000 marks, as the balance due by him to the crown when he ceased to be chancellor. B. appealed to the pope, and next day leaving Northampton in disguise, fled to France, where he spent two years in retirement at Pontigny, in Burgundy. The French monarch and the pope, however, now took up his cause. B. went to Rome, pleaded personally before his holiness, who reinstated him in the see of Canterbury. B. now returned to France, whence he wrote angry letters to the English bishops, threatening them with excommunication. Several efforts were made to reconcile Henry and B., which, however, proved futile; but at length, in 1170, a formal agreement was come to at Fretville, on the borders of Touraine. The result was, that B. returned to England, entering Canterbury amid the rejoicings of the people, who were unquestionably proud of B., and regarded him—whether wisely or not is another question—as a shield from the oppressions of the nobility; but he soon manifested all his former boldness of opposition to royal authority. At last, it is said, the king, while in Normandy, expressed impatience that none of his followers would rid him of an insolent priest. The fatal suggestion was immediately understood, and carried into effect by four barons, who departed by separate ways for England. On the evening of the 29th Dec., 1170, they entered the cathedral, and having failed in an attempt to drag him out of the church, there slew B. before the altar of St. Benedict, in the n. transept. Henry was compelled to make heavy concessions to avoid the ban of excommunication. The murderers, having repaired to Rome as penitents, were sent on a pilgrimage to Palestine; and, two years after his death, B. was canonized by pope Alexander III., and the anniversary of his death was set apart as the yearly festival of St. Thomas of Canterbury. In 1220, his bones were raised from the grave in the crypt where they had been hastily buried two days after his murder, and were by order of king Henry III. deposited in a splendid shrine, which for three centuries continued to be the object of one of the great pilgrimages of Christendom, and still lives in English literature in connection with Chaucer's *Canterbury Tales*. At the reformation, Henry VIII. despoiled the shrine, erased B.'s name from the calendar, and caused his bones to be burnt and scattered to the winds. It is extremely difficult to estimate properly the character of Becket. We do not know what his ultimate aims were, whether, as some suppose, they were patriotic, i.e., *Saxon*, as opposed to *Norman*, or, as others believe, purely sacerdotal. At all events, the means he used for the attainment of them was a despotic and irresponsible ecclesiasticism. He admitted nothing done by churchmen to be secular, or within the jurisdiction of civil courts, not even murder or larceny. Fortunately, the Plantagenets were as dogged believers in their own powers and privileges as B. in those of the church; and by their obstinate good sense, England was kept wholesomely jealous of the pretensions of Rome. See Dr. Giles' *Vita et Epistolæ S. Thomæ Cantuariensis*; canon Morris' *Life of St. Thomas Becket;* canon Robertson's *Life of Becket;* canon Stanley's *Historical Memorials of Canterbury;* Freeman's *Historical Essays*; Hook's *Lives of the Archbishops of Canterbury*; Froude's articles on B. in the *Nineteenth Century*.

BECKETS, on shipboard, a general name for any large hooks, short pieces of rope, or wooden brackets, used for confining ropes, tackles, oars, or spars in a convenient place.

BECKFORD, WILLIAM, the only legitimate son of alderman Beckford, was b. in 1760. When he was about 9 years of age, his father died, and he inherited the larger portion of an enormous property, consisting for the main part of estates in Jamaica, and of the estate of Fonthill, in Wiltshire. His annual revenue is said to have exceeded £100,000. Young Beckford evinced unusual intellectual precocity; for in 1780 he printed a satirical essay, entitled *Biographical Memoirs of Extraordinary Painters*, in which he does not spare living artists, and assails the cant of criticism with the polished

weapon of his wit. In 1778, he visited the continent, and met Voltaire at Paris. Two years thereafter, he started on his first great continental tour, and spent twelve months in rambling through Flanders, Germany, and Italy. In 1782, he made a second visit to Italy, and in 1787 he wandered through Portugal and Spain. In 1783, he married the lady Margaret Gordon, daughter of Charles, fourth earl of Aboyne, and in the following year he entered parliament as one of the members for Wells. In the same year, he published *Vathek* in French. Beckford informs us that he wrote this tale, as it now stands, at 22 years of age, and that it was composed at one sitting. "It took me," he says, "three days and two nights of hard labor. I never took off my clothes the whole time. This severe application made me very ill." Immediately on its publication, *Vathek* was translated into English; Beckford professes never to have known the translator, but thought his work well done. In 1790, he sat for Hindon; in 1794, he accepted the Chiltern Hundreds, and again left England. He fixed his residence in Portugal, purchased an estate near Cintra, and occupied for a time that "paradise" which Byron commemorated in *Childe Harold*. Tormented by unrest, he returned to England; and in 1801, the splendid furniture of Fonthill was sold by auction, and the next year his valuable collection of pictures was disposed of in London. These dispersions were no sooner made than he began a new collection of books, pictures, furniture, curiosities, and proceeded to erect a new building at Fonthill, the most prominent feature of which was a tower above 260 ft. high. Beckford resided at Fonthill till 1822, when in one of those strange vagaries of feeling, of which his life was so full, he sold the estate and house, with all its rare and far-gathered contents, to col. Farquhar for £350,000. Soon after, the great tower, which had been raised on an insecure foundation, came to the ground. On the sale of Fonthill, Beckford removed to Bath, and immediately proceeded to erect another lofty building, the plan of which also included a tower, but this time not more than 100 ft. high. While residing there, he did not mingle in Bath society, and the most improbable stories concerning the rich and morose genius in their neighborhood were circulated among the citizens, and were believed by them. During all his life, Beckford was a hard-working student, and was devoured by a passion for books. Some of his purchases were perfectly imperial in their way. He bought Gibbon's library at Lausanne, to amuse himself when he happened to be in that neighborhood. He went there; read in the fierce way that he wrote, three days and two nights at a sitting; grew weary of his purchase; and handed it over to his physician, Dr. Scholl. Up till 1834, he had published nothing since *Vathek*; but in that year the literary silence of half a century was broken by the appearance of a series of letters, entitled *Italy, with Sketches of Spain and Portugal*, in two volumes. In the same year he republished his *Memoirs of Extraordinary Painters;* and in 1835, he issued another volume, entitled *Recollections of an Excursion to the Monasteries of Alcobaca and Batalha*, made in June, 1794. From the period of this last publication till his death, which took place on the 2d of May, 1844, he lived in the deepest retirement.

Beckford, since the publication of his Arabian tale, has been a power in English literature. His wit, his sarcasm, his power of graphic description, may be seen in his journal and letters; and his higher faculties of imaginative conception and delineation reign in the unmatched passages that shadow forth in gloom and glory the "Hall of Eblis."

BECKMANN, JOHANN, a German author, known by his works on natural history and agriculture, was b. at Hoya, in Hanover, June 4, 1739. After holding, for about two years, a professorship of physics and natural history in St. Petersburg, he made a tour through Sweden, where he gained an acquaintance with the working of mines, and received for some time instructions from Linnæus. In 1766, he was appointed professor of philosophy, and in 1770 ordinary professor of political economy at Göttingen, where he died, Feb. 4, 1811. He was the first German author who wrote on agriculture in a scientific style. Among his works may be mentioned: *Principles of German Agriculture* (6th ed. 1806), *Introduction to Technology* (5th ed. 1809), *Introduction to the Science of Commerce* (1789), and *Contributions to the History of Inventions* (1780–1805).

BECKX, PIERRE JEAN, b. Belgium, 1795; a general of the order of Jesuits. He became a member of the society of Jesus in 1819, and was the head of the order in 1853. Soon after receiving orders, his superiors recognized his rare abilities, and sent him on several delicate missions. When the duke Ferdinand of Anhalt-Köthen became a convert to the Roman Catholic religion, young Beckx was appointed his confessor, and he officiated for some years as priest of the new church which was built at Köthen. After the death of the duke, B. continued at the court with the widow, the countess Julia, whom, at a later period, he accompanied to Vienna. In 1847, he became procurator for the province of Austria, and in this capacity he went to the college of procurators at Rome. In the following year the Jesuits were temporarily driven from Austria, and consequently father B. went to Belgium, where he was nominated rector of the Jesuit college at Louvain. When the Jesuits were re-established in Austria, he zealously supported the projects of the government, which were highly favorable to the interests of the church. He lent his powerful aid to the primate of Hungary, cardinal Szeitowsky, who succeeded in obtaining the reinstatement of the Jesuits in that portion of the empire, and in founding the noviciate at Tyrnau. Being sent to the assembly at Rome

in 1853, to choose a successor to father Roothan, he was elected superior of the order. The success of the Jesuits since that time, especially in non-Catholic countries, is due, in no slight degree, to the ability and foresight of father B. Besides some minor writings and occasional discourses, he has published a *Month of Mary*, which has passed through numerous editions, and been translated into many languages.

BECQUEREL, ANTOINE CÉSAR, a distinguished French physicist, was b. 7th Mar., 1788, at Chatillon-sur-Loing, in the department of Loiret. In 1808, he entered the French army as an officer of engineers, and served with distinction in Spain under marshal Suchet. He took part in the sieges of Tortosa, Tarragona, Valencia, and other places. On his return to France, he was appointed inspector of the *Ecole Polytechnique;* in 1814, he went through the campaign of France; and at the peace of 1815, retired from the service, that he might pursue his scientific studies with greater advantage. In 1819, he published a volume of geological and mineralogical researches, after which, his attention was principally devoted to electricity and magnetism. While studying the physical properties of yellow amber, B. had occasion to make experiments on the liberation of electricity by pressure. This led him to investigate the laws by which the phenomena of liberation are governed in chemical action. The result of his inquiries was the overthrow of Volta's theory of contact, and the construction, by him, of the first constant pile. He next discovered a method of determining the internal temperature of human and animal bodies, and by physiological applications demonstrated that, when a muscle contracts, there is a development of heat. B. is besides one of the creators of electro-chemistry. His labors in this branch of science opened for him, in 1829, the door of the *Académie de Sciences*. Since 1828, he had begun to apply electro-chemistry in the reproduction of mineral substances, and in the treatment by the humid way of silver, lead, and copper ores. In 1837, he was elected a member of the royal society of London. Among his works were the *Traité de l'Electricité et du Magnetisme; Traité d'Electro-chémie; Traité de Physique; Éléments de Physique terrestre et de Météorologie.* He died on the 19th Jan., 1878.—BECQUEREL, ALEXANDRE EDMOND, son of Antoine César B., an eminent physicist, was b. at Paris, 24th Mar., 1820. He was decorated with the legion of honor in 1851, and was appointed professor of physics in the *Conservatoire des Arts et Métiers*, 1853. He is a member of the *Académie des Sciences*. To his conjoint labors with his father are due interesting researches concerning the solar spectrum, and the elements of electric light (*Comptes Rendues de l'Académie*, 1839–40); *Eléments de Physique Terrestre et de Météorologie* (1847); *Memoires sur les Lois qui président à la Decomposition électro-chimique des Corps* (1849); and a *Note sur le tracé des Lignes Isothermes en France; des Recherches sur les Effets Electriques* (1852 and 1855); and *La Lumière, ses Causes et ses Effets* (1868).

BECSE, NEW, a market t. of Austria, about 4 m. e. from Old Becse. Pop. 6472.

BECSE, OLD, a market t. of the Austrian empire, in the Servian Woiwodschaft, 24 m. n.n.e. from Neusatz. Pop. 11,222.

BECSKEREK' NA'GY, or GREAT BECSKEREK, a t. of Hungary, in the co. of Torontal, situated on the left bank of the Bega, about 45 m. s.w. of Temesvar, with which place it is connected by canal. B. N. is an important market t., and has a pop. (1869) of 19,666.

BED (with some variations in spelling, the word is common to all Germanic languages), an article of household furniture on which to sleep. Beds have been and are of various forms, almost every country having its own kind of bed. In ancient times in Palestine, the B. seems to have been a simple kind of couch for reclining on during the day, and sleeping on at night, and readily removable from place to place, as is referred to in different parts of Scripture. About the heat of the day, Ishbosheth lay on his B. at noon (2 Sam. iv. 5). In receiving visitors, the king bowed himself upon the bed (1 Kings i. 47). Jesus saith, "Take up thy B., and go unto thine house" (Matt. ix. 6). Yet in these early times, beds or couches must, in some instances, have been highly ornamented: thus, "I have decked my B. with coverings of tapestry, with carved works, with fine linen of Egypt" (Prov. vii. 16). The ancient Greeks had an elegant kind of beds in the form of open couches; they rested on a frame-work with posts; their mattresses were stuffed with wool or feathers; and they had coverings of a costly nature. The Romans had latterly beds of great richness and magnificence. They were of two kinds—the *lectus triclinìaris*, or couch for reclining upon at meals; and the *lectus cubiculàris*, or B. placed in bed-chambers for sleeping in during the night. In eastern countries, at the present day, beds are for the most part simple couches or mattresses, which can be easily rolled up and carried away. In India, these couches are called *charpoys*. It will be understood that, in hot climates, few bedclothes are used—in general, there being only a single sheet employed; care is taken, however, to use mosquito-curtains, without which rest would be impracticable. See MOSQUITO.

Throughout the continent of Europe, beds are of the open couch form, suitable in width for one person. They consist of a frame or bedstead, less or more ornamental, bearing one or two hair or wool mattresses; they are often provided with curtains, which depend from the ceiling of the room. In French hotels, such beds, neatly done up, are seen in sitting-rooms. In Germany, there is a common practice of placing large

flat bags of down above the other coverings of beds, for the sake of warmth; and sometimes a bed of down altogether supplies the place of blankets. Throughout America, the beds are usually of the French, or open couch, form. The simplest kind of B. yet invented—except, indeed, the oriental rug spread on the floor—is one frequently to be seen in America. The bedstead consists of a folding trestle, constructed with canvas on the principle of a camp-stool, with a movable head-board at one end to retain the pillow. With a hair-mattress, a pillow, and the necessary coverings laid on it, this makes one of the most comfortable beds imaginable. Its great advantage consists in its being easily folded up and put away in small space. In some of the hotels in the United States, when the arrival of guests exceeds the ordinary accommodation, a number of trestle-beds can be improvised in a few minutes in one of the large halls.

To prevent the falling of dust on the face, the Romans, in same instances, used canopies (*aulæa*) over their beds; in no country but England, however, has the canopied bedstead been thoroughly perfected and naturalized. The English four-posted B., or B. proper, is a gigantic piece of furniture, to which all persons aspire; and when tastefully fitted up, it offers that degree of comfort and seclusion which is characteristic of the domestic habits of the people. Like most English beds, it is made of sufficient size to accommodate two persons—the husband and wife—and is hence known as the family-bed. The dimensions of a good family B. are as follows: lying part, 6 ft. 6 in. in length, by 5 ft. 2 in. in breadth; height from the floor, 2 ft. 9 in.; height of the posts from the floor to the top of the cornice, 9 feet. The roof or canopy is supported by the four posts, which are of mahogany, finely turned and carved. On rods along the cornice, hang curtains, which can be drawn around the sides and foot. The top stands towards the wall, so that the B. can be approached on the two sides. The curtains are composed of silk or worsted damask; in old times, they were of tapestry. With a spring-mattress below, and a wool-mattress above, the B. is complete, all but the blankets, sheets, bolster, and pillows. Ticks with feathers, laid on a hair-mattress, are also common. Fully equipped, a B., as just described, costs from £50 to £80. The great B. at Ware, in Hertfordshire, is one of the curiosities of England, and is referred to in the *Twelfth Night* of Shakespeare: "Although this sheet were big enough for the bed of Ware in England." The famous B., which is still seen in one of the inns at Ware, measures 12 ft. square, and is said to be capable of holding a dozen persons.

Latterly, a species of B. has been introduced into England, called the Elizabethan bed. In point of size, it resembles the four-poster, but it has only two tall posts, with a canopy and curtains at the head, leaving more than half of the B. exposed. The tent B. is an inferior kind of four-poster; it has a semicircular light frame roof, and light calico curtains. A more novel variety of bedsteads are those made of iron or brass, formed like open couches, which have come into very general employment. The cold and humid climate of the British islands, independently of the habits of the people, has greatly influenced the form of the B.; for although it may be more wholesome to sleep without than with curtains, it has been difficult to make the practice of doing so general, particularly during the winter and spring months. In the humbler class of rural cottages in Scotland, there still lingers the old custom of sleeping in wooden bedsteads with sliding doors. This box variety of B. is considered as unfavorable to ventilation, but it is the only kind of sleeping-place which is endurable where there are damp earthen floors and imperfect ceilings. Its use is disappearing in the progress of cottage improvement.

In old times in England, beds were formed with straw instead of wool, hair, or feathers, as at present; hence the phrase of a "lady in the straw," signifying that she is being confined. By the humbler classes in the rural districts, straw is still used for beds, and also ticks stuffed with chaff. According to an old superstition, no person could die calmly on a B. of feathers of game birds.

For invalids, there have been invented air-beds and water-beds, which are now in use, and justly appreciated. See AIR-BEDS, also WATER-BED.

BED, or STRATUM, is a layer of sedimentary rock of similar materials, and of some thickness, cohering together so as to be quarried and lifted in single blocks. Beds are often composed of many fine laminæ or plates. The laminæ are the results of intermissions in the supply of materials, produced by such causes as the ebb and flow of the tide, river-floods, or the more or less turbid state of the water under which they were deposited. When the intervals between the supply of materials were short, the numerous laminæ closely adhere, and form a bed cut off from the superior deposit, by the occurrence of a longer interval, during which the bed became consolidated more or less before the next was deposited. When the lamination is obscure, or not distinct from the stratification, it would seem to indicate that the materials had been supplied without any intermission.

BEDA, or BEDE (surnamed, on account of his learning, piety and talents, VENERABLE), the greatest name in the ancient literature of Britain, and probably the most distinguished scholar in the world of his age, was b. about the year 673 A.D. The exact spot of his birth is a point in dispute among antiquaries, but is commonly believed to have been in what is now the parish of Monkton, near Wearmouth, in Durham. In his seventh year he entered the neighboring monastery of St. Peter, at Wearmouth, where

he remained for 13 years, and was educated under the care of the abbot Benedict Biscop, and his successor, Ceolfrid. His religious instructor was the monk Trumberct; his music-master, John, chief-singer (*archicantor*) in St. Peter's Church, Rome, who had been called to England by the abbot Benedict. After these studies at Wearmouth, B. removed to the twin-monastery of St. Paul at Gyruum (now written Jarrow), founded in 682; here he took deacon's orders in his nineteenth year, and was ordained priest in his thirtieth, by John of Beverley, then bishop of Hexham. In the shelter of his quiet and sacred retreat, while the tempest of barbaric strife raged without, and the hearts of all men in England were torn by sanguinary passions, B. now began earnestly to consecrate his life to such literature as was possible in those days, including Latin and Greek, and at least some acquaintance with Hebrew, medicine, astronomy, and prosody. He wrote homilies, lives of saints, hymns, epigrams, works on chronology and grammar, and comments on the books of the Old and New Testament. His calm and gentle spirit, the humanizing character of his pursuits, and the holiness of his life, present a striking contrast to the violence and slaughter which prevailed in the whole island. To none is the beautiful language of Scripture more applicable—"a light shining in a dark place." When laboring under disease, and near the close of his life, he engaged in a translation of St. John's gospel into Anglo-Saxon, and dictated his version to his pupils. He d. May 26, 735, and was buried in the monastery of Jarrow: long afterwards (in the middle of the 11th c.), his bones were removed to Durham. His most valuable work is the *Historia Ecclesiastica Gentis Anglorum*, an ecclesiastical history of England, in five books, to which we are indebted for almost all our information on the ancient history of England down to 731 A.D. B. gained the materials for this work partly from Roman writers, but chiefly from native chronicles and biographies, records, and public documents, and oral and written communications from his contemporaries. King Alfred translated it into Anglo-Saxon. In chronology, the labors of B. were important, as he first introduced the Dionysian reckoning of dates in his work, *De Sex Ætatibus Mundi*, which served as a basis for most of the mediæval chroniclers of leading events in the world's history. Among the editions of B.'s history may be noticed: the first, published at Strasburg about 1500; a much better edition, by Smith (Cambridge, 1722); one not less valuable, by Stevenson (Lond., 1838); another, by the late Dr. Hussey (Oxf., 1846); a fourth in the *Monumenta Historica Britannica* (Lond., 1848); and that included by Dr. Giles in his edition of the whole works of B., with an English translation of the historical parts (6 vols., Lond., 1843–44). Entire editions of B.'s writings have been published in Paris (1544–54), Basel (1563), and Cologne (1612 and 1688). English versions of his *Ecclesiastical History* were published by Stapleton, in 1565; by Stevens, in 1723; by Hurst, in 1814; by Wilcock, in 1818; and by Giles, in 1840. See Gehle's *De Bedæ Venerabilis Vita et Scriptis* (Leyden, 1838); Wright's *Biographia Britannica Litteraria*, vol. i. (Lond., 1843); Surtees's *History of Durham*, vol. ii., pp. 2 to 6, 66 to 69.

BEDARIEUX, a t. of France, department of Herault, situated on the river Orb, well built, and second to none of its size in industry. Pop. '76, 7372, who are engaged in the manufacture of fine and coarse cloths, stuffs, cotton and woolen stockings, hats, paper, oil, soap, leather, etc.

BEDCHAMBER, LORDS OF THE, officers in the British royal household, twelve in number, who, in the reign of a king, wait in turn upon the sovereign's person. They are under the groom of the stole, who attends his majesty only on state occasions. There are also thirteen grooms of the B., who take their turns of attendance. The salary of the groom of the stole is £2000; of the lords of the B., £1000; and of the grooms, £500 a year. These offices in the reign of a queen are performed by ladies. Corresponding to the groom of the stole is the mistress of the robes, and to the grooms of the B. are B. women. Her majesty, queen Victoria, has usually had from ten to twelve ladies and extra ladies of the B., and eight B. women. These offices are objects of high ambition, from the access they give to the person of the sovereign, and are for the most part filled by "the prime nobility of England." They are not usually vacated on a change of ministry, and sir Robert Peel's departure from the usual etiquette on this point, in 1839, excited no small commotion.

BEDDOES, LOVELL THOMAS, eldest son of Dr. Thomas B., and of Anna, third daughter of Richard Lovell Edgeworth, of Edgeworthstown, Ireland, sister of Maria Edgeworth, the distinguished novelist, was b. at Rodney place, Clifton, on the 20th July, 1803. In 1809, Dr. Beddoes died, leaving his son to the guardianship of Mr. Davies Giddy, who, under his after-name of sir Davies Gilbert, became the president of the royal society. By this gentleman, young B. was placed at the Bath grammar school; from thence, in 1817, he removed to the Charter house; and in May, 1820, he entered as a commoner at Pembroke college, Oxford. In 1821 he published the *Improvisatore*. On this, his earliest poetic offspring, he looked with no favor at a later period, and was wont to hunt after stray copies in the libraries of his friends, and to disembowel them mercilessly when he effected a capture. In 1822, he published *The Bride's Tragedy*, which achieved for its author a great reputation. In 1824, he went to Göttingen to study medicine, and from this time forth continued to live in Germany and Switzerland, with occasional visits to England. While engaged at Frankfort (1847) in dissecting, he received a slight wound, which was the means of infusing a noxious virus into his sys-

tem. His health now began to fail. In 1848, he went to Basel, where he fell from his horse, and injured his leg. An amputation following, he died on the 26th Jan., 1849, and was buried in the cemetery of the hospital.

During his wanderings in Germany, B. was engaged at intervals in the composition of a drama entitled *Death's Jest-book*. This work, together with his other manuscripts, consisting chiefly of poetry, he, on his death-bed, confided to the care of a friend in England, desiring him to use his discretion as to their publication. In consequence, in 1851, his poetical works, with a memoir attached, appeared in two volumes. The merits of these dramatic fragments are quite peculiar. The author exhibits no power of characterization, no ability in the conduct of a story; and, on the other hand, the crush of thought and image, the tone of music, and the depth of color, are quite wonderful. Mr. B. never could have become a dramatist, and of this, during his later years, he seems to have become aware. His works pall with splendor, and are monotonous by very richness. They are like a wilderness where nature has been allowed to pour herself forth in all her waste and tropical excess, unrestrained by a pruning hand, and unpierced by any path.

BEDDOES, THOMAS, a physician of remarkable talents, and a popular writer on chemistry, physics, physiology, disease, etc., was b. at Shiffnall, in Shropshire, 1760. In his studies at Oxford and Edinburgh, he distinguished himself by his knowledge of ancient and modern languages—the modern he acquired without the aid of a teacher—and by his varied attainments in botany, mineralogy, geology, chemistry, etc. In Edinburgh he attracted the notice of Dr. Cullen, who employed him to add notes to Bergman's *Physical and Chemical Essays*. In 1785, he published a translation of Bergman's *Essays on Elective Attractions*, with valuable original notes. In 1787, he was appointed to the chemical lectureship in the university of Oxford. Here his lectures became exceedingly popular; but his unconcealed sympathies with the French revolutionary party in England, appear to have rendered his post so uncomfortable that he resigned it in 1792, and retired into the country. While in retirement, he wrote his work *On the Nature of Demonstrative Evidence, with an Explanation of Certain Difficulties Occurring in the Elements of Geometry*, which was intended to show that mathematical reasoning proceeds entirely on the evidence afforded by the senses, and that geometry is based on experiment. Several patriotic pamphlets followed, and the *History of Isaac Jenkins*, in which he laid down, in a popular style, rules of sobriety, health, etc., for the benefit of the working classes. Of this work, 40,000 copies were sold in a short time. In 1798, after having spent considerable time in studying the use of artificial or medicated gases in the cure of diseases, especially consumption, aided by his father-in-law, Mr. Edgeworth, and pecuniarily assisted by his friend, Thomas Wedgwood, he opened a pneumatic hospital at Bristol. This institution did not succeed in its main object, which was to show that all diseases being, as B. maintained, referrable to an undue proportion or deficiency of some elementary principle in the human organism, could be cured by breathing a medicated atmosphere; and B., whose zeal had abated, retired from it about a year before his death, in 1808. The only results of the enterprise were several works by B. on the application of medicated air to diseases, and the introduction to the world of Davy (afterwards sir Humphry), who was the superintendent of the institution. Sir Humphry Davy says of B.: "He had talents which would have exalted him to the pinnacle of philosophical eminence, if they had been applied with discretion." A life of B. was published in 1811 by Dr. Stock.

BEDEAU, MARIE ALPHONSE, a distinguished French gen., was b. at Vertou, near Nantes, Aug., 1804. In 1817, he entered the military school of La Flèche; in 1820, St. Cyr; and in 1825 received a commission in the army. In the Belgian campaign of 1831–32, he was aid-de-camp to gen. Gérard, and attracted notice at the siege of Antwerp. In 1836 he was sent to Algeria, as commandant of a battalion of the foreign legion. Here he acquired his great military reputation. He took part in most of the military operations by which the dominion of France was established over the natives, and rose to the rank of gen. of brigade. In 1847, he was for a short time governor of Algeria, but was superseded by the duc d'Aumale.

When the revolution of Feb. broke out, B., who was in Paris on leave of absence, was commissioned by marshal Bugeaud to suppress the insurrection. This he found it impossible to do, but his conduct on the occasion has been severely blamed. By the provisional government he was appointed minister of war, an office, however, which he immediately changed for the command of the city of Paris. On the formation of the constituent assembly, he was named vice-president, and always voted with the republican party. Along with Cavaignac, Lamoricière, and others, he was arrested on the 2d Dec., 1851, and went into exile. B. was a Roman Catholic, and the fervor of his convictions gave rise to the groundless rumor that he had entered into holy orders. He died in 1863.

BEDEGUAR, a remarkable gall (q.v.) often found on the branches of various species of rose, particularly of the sweet-brier, upon which account it is sometimes called sweet-brier sponge. It is produced sometimes by *cynips rosæ*, sometimes by other species of gall insect. It is usually of a roundish shape, often an inch or more in diameter; its nucleus is spongy and fibrous, containing numerous cells, in each of which is a small

larva; externally it is shaggy, being covered with moss-like branching fibers, which are at first green, afterwards purple or red. It was formerly in some repute as a diuretic and as a remedy for stone; it has more recently been recommended as a vermifuge, and as a cure for toothache.

BEDELL, Gregory Thurston, D.D., b. N. Y., 1817; son of Gregory Townsend; educated in Bristol college, Penn.; was rector of the Protestant Episcopal church of the Ascension in New York city from 1843 to 1859, when he was chosen bishop of Ohio. Among his works are *The Divinity of Christ, The Profit of Godliness, Principles of Pastorship, Sacredness of the Grave, The Age of Independence*, etc.

BEDELL, Gregory Townsend, D.D., 1793–1834; b. N. Y.; a clergyman of the Protestant Episcopal church; graduated at Columbia college, and won high position as a preacher. He published *Onward, or Christian Progression, Renunciation, Haymarkets, Ezekiel's Vision, Bible Studies*, sermons, etc.

BEDELL, William, one of the best prelates that have adorned the English church, was b. at Black Notley, Essex, in 1570. He was educated at Emmanuel college, Cambridge, and after his ordination, officiated as a clergyman for several years at Bury St. Edmunds. In 1604, he accompanied Sir Henry Wotton as his chaplain to Venice. There he resided 8 years, deeply engaged in study, and honored by the friendship of many distinguished men, in particular of father Paul Sarpi, then engaged in the composition of his celebrated *History of the Council of Trent*. While residing here, he translated the English *Common Prayer Book* into Italian, which was highly appreciated by many of the Venetian clergy. On his return home, he resumed his pastoral duties at Bury, where he lived for some time in such retirement, that when his friend Diodati came to England, he inquired in vain for the admirable B., whose merits were so well known at Venice. He had given up hopes of finding him, when one day he encountered him in the streets of London. In 1615 B. was presented to the living of Horingsheath, in Suffolk, where he remained 12 years. His retired life and his Calvinistic theology long hindered the recognition of his merits. At length, in 1627, he was unanimously elected provost of Trinity college, Dublin, to which the fame of his learning and piety had extended. He refused to undertake the charge till positively commanded by the king. At the end of two years, he was promoted to the united bishoprics of Kilmore and Ardagh, the latter of which he resigned in the following year, 1630. He immediately set himself to reform the crying abuses that prevailed in his diocese, and with so happy a combination of wisdom, firmness, and charity, that even his enemies were constrained to do homage to his virtues. Among his other remarkable acts, he removed his lay-chancellor, and took upon himself the ancient episcopal jurisdiction of hearing and deciding causes. The chancellor obtained a decree against him in chancery, with costs, but was so impressed with the superiority of the bishop's services to his own, that he dropped his claim, and even appointed a surrogate, with orders to pay implicit obedience to the authority of the bishop. The translation of the Old Testament into Irish was accomplished under B.'s direction (the New had been already translated), as well as some of the homilies of Chrysostom and Leo on the reading of the Scriptures. On the breaking out of the rebellion in 1641, his popularity for some time saved his family from violence, his being the only English house in the county of Cavan that was spared. At length, on his refusal to dismiss his flock, he was seized, and imprisoned in the castle of Cloughboughter. Thence he was removed to the house of a Protestant clergyman, where he continued to minister officially till his death, at the end of a few weeks, Feb. 7, 1642, in the 71st year of his age. The rebels followed his body to the grave in the churchyard of Kilmore. Besides some other works, B. translated the last two books of father Paul's history. His life was written by Burnet.

BEDESMAN, one who solicits or prays for something. The Anglo-Saxons called a prayer "bead," and in manuscripts of the 15th c. are the expressions before the name, "Your humble bedesman," or "bedeswoman."

BEDFORD, a co. in Pennsylvania on the Maryland border, drained by the Juniata, and reached by the Bedford division of the Pennsylvania railroad; 1000 sq.m.; pop. '80, 58,534. It has a mountainous surface, but is good for cattle raising. Coal mining is also carried on. Co. seat, Bedford.

BEDFORD, a co. in central Tennessee, on Dutch river, intersected by the Nashville and Chattanooga railroad; 550 sq.m.; pop. '70, 24,333—6484 colored. It has an undulating and fertile surface; produces corn, wheat, tobacco, cattle, etc. Co. seat, Shelbyville.

BEDFORD, a co. on the James river in s. Virginia, intersected by the Ohio, Mississippi and Atlantic railroad; 504 sq.m.; pop. '70, 25,327—10,770 colored; in '80, 31,226. The chief crops are cereals, tobacco, and wool. The peaks of Otter in this co. present magnificent scenery, and the Bedford alum springs are valuable. Co. seat, Liberty.

BEDFORD, a village and capital of B. co. in Penna., on the Huntington and Broad Top railroad, 94 m. w.s.w. of Harrisburg; pop. '70, 1247. The B. springs are a fashionable summer resort. There are iron and other manufactories in the village.

BEDFORD (Saxon, *Bedcanford*, town of the ford), the chief t. of Bedfordshire, is situated on the Ouse (which is navigable thence to the sea, a distance of 74 m.), about

63 m. n.n.w. of London by rail, and in the midst of a broad expanse of rich pasture, wheat, and barley lands. The town is clean and well paved, and the drainage has been recently greatly improved by the board of health. The charitable and educational institutions of B. are mostly due to sir W. Harpur, alderman of London, in 1561, who founded a free school, and endowed it with 13 acres of land. The enormous increase in the value of the property (from £150 to £14,000 or upwards a year) enables the trustees to maintain grammar, modern, and preparatory schools for boys, the same class of schools for girls, and 45 almshouses. Formerly, much of the charity was under the control of popularly elected trustees, but under the endowed schools act, the constitution has been changed. Now, the governing body consists of 27, instead of 52, members—6 *ex officio* (the mayor of B., the lord-lieutenant of the county, and the members of parliament for the town and county), 9 nominated, and 12 representative. The eleemosynary element—shown in the maintenance of almshouses, the giving of marriage-portions and apprentice-fees, etc.—used to be predominant in the distribution of the charity, but now the educational prevails, the funds being annually divided thus: One eleventh to the maintenance of the almshouses; two elevenths to elementary education; four elevenths to the grammar-school, and high-school for girls; and four elevenths to the modern schools. The only important manufacture of B. is that of iron goods, especially agricultural implements. Lace-making and straw-plaiting employ many poor women and children. A considerable traffic in malt, timber, coals, and iron is maintained with Lynn Regis, by means of the Ouse. B. is of great antiquity, and is mentioned in the Saxon chronicle under the name of Bedcanford, as the scene of a battle between the Britons and Saxons in 571. The Danes burnt it in 1010. Afterwards its old castle, said to be built by Edward the elder, is frequently mentioned in history. B. has returned two members to parliament since 1295. Pop. '71, 16,850. John Bunyan was born near Bedford. He dreamed his immortal dream in B. jail, and ministered to the Baptist congregation in Mill lane from 1671 to his death in 1688. The inhabitants still hold his memory in deep veneration, and some relics of him are preserved. A handsome new building, Italian in style, for the Bunyan schools, was completed in 1867. A bronze statue of Bunyan was erected by the duke of Bedford in 1874.

BEDFORD, DUKE OF. There have been two distinct dukedoms of B. That to be noticed here existed in the person of John Plantagenet, regent of France, and third son of Henry IV. of England, who was born about 1389. During his father's lifetime, he was governor of Berwick-upon-Tweed, and warden of the Scottish marches. In 1414, the second year of his brother's reign, he was created duke of B.; and he was made commander-in-chief of the forces in England while Henry V. was carrying on the war in France. After the death of Henry V. (1422), B., in accordance with the dying wish of the king, left the affairs of England in the hands of his brother Gloucester, and went to France to look after the interests of the infant prince, his nephew. The regency of France, in compliance with a request of his deceased brother, he offered to the duke of Burgundy, who refused it; he then assumed it himself, but not without consulting Burgundy as to the best method of carrying out the treaty of Troyes, by which Charles VI. declared Henry V. next heir to the French crown. On the death of Charles VI., a few months after Henry V., B. had his nephew proclaimed king of France and England, as Henry VI. In the wars with the dauphin which followed, B. displayed great generalship, and defeated the French in several battles—most disastrously at Verneuil, in 1424. But, in consequence of the rather parsimonious way in which men and money were doled out to him from England, and the withdrawal of the forces of the duke of Burgundy, he was unable to take full advantage of his victories. The appearance of Joan of Arc, notwithstanding the utmost energy of B., was followed by disaster to the English arms; and in 1435, B. was mortified by the treaty of peace negotiated at Rouen between Charles VII. and the duke of Burgundy, which effectually ruined English interests in France. The death of the regent, which took place Sept. 19, 1435, 14 days before the ratification of the treaty, was mainly, if not altogether, occasioned by his anxiety and vexation on account of the union thus formed. B., who was a patron of letters, purchased and removed to London the royal library of Paris, consisting of 900 volumes. For the present family of B., see RUSSELL, HOUSE OF.

BEDFORD, GUNNING S., 1806–70; b. Baltimore; a graduate at St. Mary's college, Md.; was professor in Charleston, S. C., in Albany medical college, and of midwifery in the New York university. Among his works are treatises on obstetrics, *Lectures on Diseases of Women*, etc.

BEDFORD LEVEL, an extensive tract of flat land on the e. coast of England, embracing nearly all the marshy district called the Fens. It extends inland around the Wash into the 6 counties of Northampton, Huntingdon, Cambridge, Lincoln, Norfolk, and Suffolk, and has an area of about 450,000 acres. Its inland boundary forms a horseshoe of high lands, and reaches the towns of Brandon, Milton—3 m. n.n.e. of Cambridge—Earith, Peterborough, and Bolingbroke. It is divided into three parts—the n. level, between the rivers Welland and Nene; the middle, between the Nene and the old Bedford river; and the s., extending to Stoke, Feltwell, and Mildenhall. It is intersected by many artificial channels, as well as by the lower parts of the rivers Nene, Cam, Ouse (Great and Little), Welland, Glen, Lark, and Stoke. It receives the waters of the whole

or parts of 9 counties. This district seems to have been a great forest at the time of the Romans, who cut the forest down; formed great embankments, to exclude the tide; and rendered the tract for a time a fertile inhabited region. The emperor Severus, in the 3d c., made roads through it, one of which is now covered with 2 to 5 ft. of water. In the 13th c., violent incursions of the sea stopped the outflow of the rivers; and it became a morass. The practicability of draining this extensive region seems to have been thought of as early as 1436, and many partial attempts were made after this. The first effectual effort was in 1634, when Francis, earl of Bedford, after whom the district was thenceforth called, obtained, along with 13 others, a charter to drain the level, on condition of receiving 95,000 acres of the reclaimed land. The work was partially accomplished in 3 years, at the expense of £100,000; but was pronounced by the government to be inadequate. Charles I. tried to get the work, with a greatly increased premium, into his own hands; but the civil war stopped further progress. In 1649, parliament confirmed William, earl of Bedford, in the rights granted to his father; and after a fresh outlay of £300,000, the contract was fulfilled. In 1688, a corporation was formed for the management of the level. The middle level has always been the most difficult to manage. St. Germain's sluice, at the confluence of the great drain in this district with the Ouse, was considered perfectly secure. But in May, 1862, this sluice gave way under the pressure of a strong tide, and the western bank of the middle level drain burst, speedily flooding about 6000 acres of fertile land. This led to the construction of a permanent coffer-dam of pile work, to shut off the tidal waters; and for the drainage of the middle level, Slater's-Lode sluice, the old outlet to the Ouse, was taken advantage of; and siphon pipes were laid over the coffer-dam, the flood-waters let off by them and by drains; the siphons acting as a permanent sluice.

BEDFORDSHIRE, a midland co. of England, bounded n.e. by Huntingdon; e. by Cambridge; s.e. and s. by Hertford; s.w. and w. by Buckingham; and n.w. by Northampton. It stands 37th of the 40 English counties in size, and 37th also in population. Extreme length, 31 m.; breadth, 25. Area, 463 sq.m., five sixths being arable, meadow, and pasture lands. The general surface is level, with gentle undulations. In the s., a range of chalk-hills, branching from the Chilterns, crosses B. in a n.e. direction from Dunstable, and another parallel range runs from Ampthill to near the junction of the Ivel with the Ouse. Between the latter ridge and the n.w. part of the county, where the land is also somewhat hilly, lies the corn vale of Bedford. No hill in B. much exceeds 900 ft. in height. The chief rivers are the Ouse (running through the center of the county, 17 m. in a direct line, but 45 by its windings), navigable to Bedford; and its tributary, the Ivel, navigable to Shefford. By these rivers, B. communicates with the counties of Cambridge, Huntingdon, and Norfolk. The s. and s.e. parts of the county consist of chalk, and the n. and n.w. of oolitic strata. Freestone is quarried, as well as chalk or clunch, to be burnt for lime. The soil varies greatly. In the s. of the county, it is chalk thinly covered with earth, and fit only for sheep-walks; but three fourths of the county is clay, which is very stiff between the Ivel and Ouse. A rich gravelly loam exists along the rivers. In the vale of Bedford, the soil is chiefly rich clay and deep loam; and to the n. the clay is stiff, poor, and wet. There are extensive market-gardens, especially on the rich deep loams. The chief crops are wheat, beans, and barley. The total acreage of B. under all kinds of crops, bare fallow, and grass, for the year 1876, was 256,567; of wheat, 46,767; barley or bere, 34,164; oats, 11,611; rye, 466; beans, 16,036; peas, 6376; total under corn crops, 115,426. B. is the most exclusively agricultural county in England. The principal proprietors are the duke of Bedford, the marquises of Tavistock and Bute, earl de Grey, lords Holland, Carteret, and St. John. Lace-making and straw-plaiting—for which Dunstable is celebrated—are the only branches of industry practiced to any extent, and they are carried on almost entirely by women. B. is divided into 9 hundreds, and contains 10 market-towns, 124 parishes, and 6 poor-law unions. Pop. '71, 146,257. Two members of parliament are returned for the county of B., and two for the town of Bedford. Many British and Roman antiquities exist in B., as well as the ruins of several monasteries, and some fine relics of Anglo-Saxon, early English, and Norman architecture among the parish churches. Three Roman ways once crossed the county, and several earthwork camps still remain.

BEDLAM, a popular corruption of Bethlehem, the name of a hospital for lunatics, in St. George's Fields, London. It was originally founded in Bishopsgate street Without, in 1246, by Simon Fitz-Mary, one of the sheriffs of London, as "a privy of canons with brethren and sisters." When the religious houses were suppressed by Henry VIII., the one in Bishopsgate street fell into the possession of the corporation of London, who converted it into an asylum for 50 or 60 insane persons. In the year 1675, the hospital was taken down, and a new one, affording accommodation for about 150 patients, was erected in Moorfields, at a cost of about £17,000. In 1814, the hospital was again pulled down, and the patients transferred to a new hospital in St. George's fields, erected for 198 patients; but in 1838 extended so as to accommodate 166 more. The building, with its grounds, now covers an area of 14 acres, and is lacking in nothing likely to insure the comfort or promote the recovery of patients. In former times, the management of B. was deplorable. The patients were exhibited to the public, like wild

beasts in cages, at so much per head, and were treated and made sport of by visitors, as if they had been animals in a menagerie. The funds of the hospital not being sufficient to meet the expenditure, partially convalescent patients, with badges affixed to their arms, and known as Tom-o'-Bedlams, or "Bedlam beggars," were turned out to wander and beg in the streets. Edgar, in Shakespeare's *Lear*, assumes the character of one of these. This practice, however, appears to have been stopped before 1675; an advertisement in the *London Gazette* of that date, from the governors of B., cautions the public against giving alms to vagrants representing themselves as from the hospital, no permission to beg being at that time given to patients. Now, the moral and physical management of the patients is so excellent, that annually more than one half of their number are returned as cured.

BEDLINGTON TERRIER, a dog so called from a village and parish of that name in Northumberland, one of the districts in which the race has been extensively bred. The chief points of a model B. T. are the following: Muzzle, rather long and fine, but powerful; head, high and rather narrow, the hair on the top being more silky and of a lighter color than on the rest of the body; eyes, small, round, and rather sunk; ears, filbert-shaped, hanging close to the head, slightly feathered at the tips; neck, long, slender, but muscular; body, well proportioned, slender, and deep chested; toes, well arched; legs, straight and rather long; tail, tapering to a point, with no feather; coat, somewhat fine but not silky, short and rather thin; color, liver or sandy, with dark flesh-colored nose, or blue-black, with black nose; height, 13 to 15 inches. The B. T. is greatly valued on account of its unsurpassed courage, its speed, and its sagacity. It is determinedly hostile to all kinds of vermin, and will face even the otter, fox, or badger without flinching. It is also a capital water-dog. The n. of England is the district *par excellence* of the true B. T., the dogs reared by breeders at or in the neighborhood of Newcastle usually receiving the awards of merit at dog-shows. The origin of the B. T. is not very certainly known, but it seems proved that the breed existed in Rothbury (also in Northumberland, to the n. of Bedlington) before it was known in the district whence it takes its name.

BEDLOE'S ISLAND, in the bay of New York (named after an early owner); ceded to the federal government for the purpose of harbor defense, and now occupied by fort Wood. It is a mile and a half w. of the Battery, or s. point of the city.

BEDMAR, Alfonso de Cueva, Marquis de, was b. in 1572. He has won an enduring notoriety on account of his daring and unscrupulous plot for the destruction of Venice, to which city he had been appointed ambassador from the court of Spain in 1607. It was a difficult office to fill, for Venice and Spain cherished most unfriendly feelings towards each other. Bedmar probably conceived that he was acting a patriotic and justifiable part, in taking advantage of his position to play the spy and conspirator; but whether or not, his scheme was contrived with admirable ingenuity. He first leagued himself secretly with the duke of Ossuna, viceroy of Naples, and Don Pedro of Toledo, governor of Milan, whom he made his confidants and coadjutors. He then purchased the services of a large number of foreign mercenaries, and scattered them through the city, to prevent suspicion. Ossuna furnished him with a band of semi-pirates, who were to enter the Venetian fleet, corrupt the sailors, and hinder operations in any way they could. The conspirators were to set fire to the arsenal of the republic, and seize all the important posts. At this precise moment, the Milanese troops were to appear at the extremity of the mainland, and those sailors who had been seduced from their allegiance were to convey them rapidly over to Venice. A Spanish fleet was to creep up the Adriatic, in order to assist if necessary. The city was then to be plundered and destroyed. The day chosen was that on which the doge wedded the Adriatic, when all Venice was intent on beholding the august ceremony. Fortunately, the night before the crime was to have been perpetrated, one of the conspirators betrayed the whole. Several persons were executed; but curiously enough, Bedmar, the arch-delinquent, was only dismissed. This has excited the skepticism of many writers as to the truth of the accusation; but the evidence in favor of the historic reality of the plot is generally held to be incontestable. The event forms the subject of Otway's popular and pathetic play, *Venice Preserved*. Bedmar now went to Flanders, where he became president of the council, and, in 1622, was made a cardinal by the pope. He then went to Rome, and finally returned to Spain as bishop of Oviedo, where he died in 1655. He is said to have been the author of a pamphlet published in 1612, directed against the liberties of Venice. It is entitled *Squittino della Liberta Veneta*.

BEDNORE', or Nuggur, a decayed city of Mysore, India, situated in the midst of a basin in a rugged tableland of the western Ghauts, at an elevation of more than 4000 ft. above the sea, in n. lat. 13° 50', e. long. 75° 6', 150 m. n.w. from Seringapatam. It was at one time the seat of government of a rajah, and its pop. exceeded 100,000. In 1763, it was taken by Hyder Ali, who pillaged it of property to the estimated value of £12,000,000, and subsequently made it the seat of his own government, calling it Hydernuggur (Hyder's town), of which the name Nuggur is an abridgment. It was taken by the British under gen. Matthews in 1783, but soon retaken by Tippoo, at the head of a vastly superior force, when gen. Matthews and all the principal British officers were put to death. The neighboring country is mostly covered with dense and luxuriant forests.

BED OF JUSTICE (Fr. *lit de justice*), literally, the seat or throne occupied by the French monarch when he was present at the deliberations of parliament. Historically, a B. of J. signified a solemn session, in which the king was present, to overrule the decisions of parliament, and to enforce the acceptance of edicts or ordinances which it had previously rejected. The theory of the old French constitution was, that the authority of parliament was derived solely from the crown: consequently, when the king, the source of authority, was present, that which was delegated ceased. Acknowledging such a principle, the parliament was logically incapable of resisting any demand that the king in a B. of J. might make, and decrees promulgated during a sitting of this kind were held to be of more authority than ordinary decisions of parliament. Monarchs were not slow to take advantage of this power to overawe any parliament that exhibited signs of independence. The last B. of J. was held by Louis XVI. at Versailles in Sept., 1787.

BEDOS DE CELLES, Don JEAN FRANÇOIS, a Benedictine monk of the congregation of St. Maur, and the most learned and practical master of the art of organ building in the 18th c., whose work on the art is to the present day of the greatest importance. He was born about 1714 at Chaux, and entered his order in 1726 at Toulouse, where he built several large and superior church-organs. He was elected a member of the academy of sciences in 1758; in 1770, he completed for the academy his great work, *L'Art du Facteur d'Orgues*, in 4 vols., large folio, with 137 copper plates, beautifully executed. This work has never been translated into English, but the greater part of it has been translated into German, B. de C. died in 1797.

BEDOUINS (Ar. *Bedawi*, plur. *Beduân*, "dwellers in the desert") are Arabs who lead a nomadic life, and are generally regarded, according to tradition, as the descendants of Ishmael, and the aborigines of Arabia. The most ancient notices found in Scripture agree, in their descriptions of the manners and customs of the B., with the facts of the present time. As nomads, the Bedouin Arabs have no united history, but only a collection of genealogies. They have but seldom appeared as a united people, taking a prominent part in the world's politics, and have never been entirely held in subjection by any foreign power. The desert of Arabia, especially the plateau of Nedjid, is their central place of abode; but, even in ancient times, they had spread themselves over the deserts of Egypt and Syria; and, in later times, after the decay of ancient civilization, they entered Syria, Mesopotamia, and Chaldea. The conquest of northern Africa, in the 7th c., opened up to them still vaster tracts, and they soon extended themselves over the Great Desert to the shores of the Atlantic ocean. At present, they are to be found scattered over an immense breadth of territory—viz., from the western boundary of Persia to the Atlantic, and from the mountains of Kurdistan to the negro countries of Sudan. In the cultivated lands of Mesopotamia, Chaldea, the Syrian confines, Barbary, Nubia, and the n. of Sudan, the Arabs are found intermingled with other nations; but in the deserts they have maintained their distinct character and independence. The characteristics of the B., as herdsmen and robbers in the desert, are intimately connected with the nature of their habitation. Their abstinent, precarious, and often solitary mode of life, makes them disposed to exercise mutual hospitality; but their independence, love of liberty, and other good qualities, are associated with violent passions and an infamous love of plunder, which is utterly reckless of the rights of property. They are generally well-made men, lean, sinewy, and active; but, on account of frequent hardships and privations, are commonly below middle stature. Their senses, especially sight, are keen, and their carriage is free and independent. The nose is commonly aquiline, the face rather lengthened, and the eyes are well shaped and expressive of both daring and cunning. In complexion, they have various shades of brown. With the exception of certain tribes in Syria, all the B. are professedly Mohammedans, but by no means strict in the observance of their religious rites and duties. Their *marabouts* (q.v.) —a class of ascetics—take the place of priests, and exercise considerable influence in all social and public affairs. As the Arabs have no settled government or policy, religious traditions and customs form the only bond of order and union among them. Though their intellectual powers are naturally good, they are miserably destitute of solid knowledge. Their endless tales and poetical effusions show a wonderful activity of imagination and an oriental love of hyperbole. The relation of the sexes to each other is less constrained than among the settled peoples of the east, and a substitute for polygamy is found in a frequent interchange of wives. Their favorite pastimes are the chase, ball-play, dancing, songs, stories, and the *dolce far niente* (pleasant laziness) of drinking coffee and smoking narghiles. Their diet is principally derived from their herds, but includes a few vegetables and even locusts and lizards. Honey is also a principal luxury with all classes, and, moreover, one which has a religious sanction, for is was indulged in by Mohammed himself, who makes copious mention of it in the Koran. They manufacture their own woolen clothing, which consists of the *haikh*—a long, wide garment fastened on the head and descending to the feet—and the *burnoose*, a large mantle. Only superior men wear breeches and linen or cotton shirts. The hair of the head is shaven, but the beard is a favorite object of cultivation. The political condition of the B. may be styled patriarchal. One or more families, the males of which bear the title of *sheik*, form the core of a tribe, and, along with the marabouts, or priests, constitute a kind of aristocracy. Out of their number, the superior *sheik*, or

kaid, is elected, who rules in patriarchal style over the whole tribe. This general sketch of the B. applies chiefly to the true nomads, or "dwellers in the desert," and is subject to several modifications with regard to tribes located in Barbary, Syria, and Mesopotamia, who practice agriculture, and dwell in houses.

BED-SORES are often a very troublesome complication of disease, to which a patient is liable when for a long time confined to bed, and is either unable or is not allowed to change his position. Thus they are liable to occur in cases of continued fever, or any other prolonged debilitating disorder, in paralysis from injury of the spinal cord, and in cases of fracture of the thigh. The skin, at certain projecting bony parts, chiefly about the region of the buttocks, or on the heel, is apt to inflame, ulcerate, and slough, especially if the patient is not kept perfectly clean—as, for example, when the evacuations and urine escape involuntarily. The patient sometimes complains of a sense of discomfort at the parts, as if he were lying on dry crumbs of bread; at other times, he seems to feel nothing. Hence, in all cases of prolonged supine position, the parts naturally pressed upon by the weight of the body should be carefully examined every day or two, as prevention is far easier than cure. When a long confinement to bed is expected, attempts should be made to thicken the cuticle, and enable it to bear pressure better, by rubbing the skin with a stimulant such as spirits or eau-de-Cologne. If the part, when first seen, looks red and rough, further damage is often prevented by covering it with a piece of calico, on which soap-plaster has been spread; the local pressure may be removed by air-cushions specially constructed for cases of this kind, and in many instances, Arnott's water-bed (q.v.) affords great comfort. If the case is one in which it is admissible, the patient should be made to alter his position frequently. When there are excoriations, and a threatening of sloughing, a poultice composed of equal parts of bread-crumbs and of finely-grated mutton suet, mixed over the fire in a saucepan, with a little boiling water, is often a comforting and useful application. After sloughing has fairly begun, stimulating applications, such as resin ointment, must be applied. It is worthy of notice that bed-sores come on earlier in cases of fractured spine than in any other: they generally appear by the fourth day, and have been seen two days after the accident. They commonly form one of the most powerful agents in destroying life in cases of this accident, diseases of the urinary organs being the other.

BEDSTRAW, *Galium*, a genus of plants belonging to the natural order *rubiaceæ* (q.v.), and distinguished by a small wheel-shaped calyx, and a dry two-lobed fruit, each lobe containing a single seed. The leaves, as in the rest of the order, are whorled, and the flowers minute; but in many of the species the panicles are so large and many-flowered that they are amongst the ornaments of the banks and other situations in which they grow. The species are very numerous, natives chiefly of the colder parts of the northern hemisphere, or of mountainous regions within or near the tropics. About 16 species are found in Britain, some of them very common weeds. Amongst these is the YELLOW B. (*G. verum*)—sometimes called CHEESE RENNET, because it has the property of curdling milk, and is used for that purpose—a small plant with linear deflexed leaves and dense panicles of bright yellow flowers, very abundant on dry banks. The flowering tops, boiled in alum, afford a dye of a bright yellow color, much used in Iceland; and the Highlanders of Scotland have long been accustomed to employ the roots, and especially the bark of them, for dying yarn red. They are said to yield a red color fully equal to that of madder, and the cultivation of the plant has been attempted in England. The roots of other species of the same genus possess similar properties, as those of *G. tinctorium*, a species abundant in low marshy grounds in Canada; and those of *G. septentrionale*, another North American species, used by some of the Indian tribes. Like madder, they possess the property of imparting a red color to the bones and milk of animals which feed upon them. Medicinal virtues have been ascribed to some of the species, as *G. rigidum* and *G. Mollugo*, which have been extolled as useful in epilepsy.—The roasted seeds of some, as *G. aparine*, the troublesome *goosegrass*, or *cleavers*, of our hedges —remarkable for the hooked prickles of its stem, leaves, and fruit—have been recommended as a substitute for coffee; but it does not appear that they contain any principle analogous to caffeine. This plant is a native of the northern parts equally of Europe, Asia, and America. Its expressed juice is in some countries a popular remedy for cutaneous disorders.—The roots of *G. tuberosum* are farinaceous, and it is cultivated in China for food.—The name B. is supposed to be derived from the ancient employment of some of the species, the herbage of which is soft and fine, for strewing beds.

BEDWIN, GREAT, a t. of Wiltshire, on the Kennet and Avon canal and the Great Western railway, 69 m. w. by s. of London. Pop. '71, 2068. A fierce, indecisive battle occurred here in 674, between the kings of Mercia and Wessex. St. Mary's church was built in the beginning of the 14th c., and is constructed of flint, except the piers, arches, and dressings, which are of freestone. Jane Seymour, one of the queens of Henry VIII., and Dr. Willis, an eminent physician of the 17th c., were born here. In the end of last century, the remains of a Roman villa were discovered, including tesseræ, bricks, a tesselated pavement, a huge leaden cistern, and the foundations of baths.

BEDWORTH, a t. in Warwickshire, 5 m. n. of Coventry, and 96 m. n.w. of London. Ribbons and trimmings are made in the town to some extent, and silk-mills, malt-kilns, lime-kilns, brick-fields, and collieries in the neighborhood furnish employment to

large number of the inhabitants. B. is a station on the Coventry and Nuneaton railway. The pop. in 1871 was 3405, a decrease from that of 1861, which amounted to 3968.

BEE, the common name of a very large family of insects, of the order *hymenoptera* (q.v.), belonging to the section of that order called *aculeata*, in which the females are furnished not with an ovipositor, but (usually) with a sting. Bees were all included by Linnæus in the genus *apis* (Lat. for B.), but are now divided into many genera; and the name *anthophila* (Gr. flower-loving) or *mellifera* (Lat. honey-bearing) is given to the family which they constitute. All bees in a perfect state feed exclusively or chiefly on saccharine juices, particularly the nectar or honey of flowers; and the ordinary food of their young, in the larva state, is the pollen of flowers, or a paste, often called bee-bread, composed of pollen and honey. They evidently perform a very important part in the economy of nature, in the fertilization of flowers, which depends upon the contact of particles of the pollen with the stigma; and, as if to secure this object more perfectly, in their search for honey and pollen, they usually—some have perhaps too hastily said always—pass from flower to flower of the same kind, and not to flowers of different kinds indiscriminately. They abound in almost all parts of the world, but particularly in the warmer parts of it. Not fewer than 250 species are known as natives of Britain.

To enable them to reach their liquid food at the bottom of the tubes of flowers, and in the little receptacles in which it is produced, bees have certain parts of the mouth—the *maxillæ* and *labium* (see INSECTS), or lower jaws and lower lip, with their feelers (*palpi*)—elongated into a sort of proboscis; and the *ligula* is elongated, sometimes, as in the common hive B., assuming the form of a filament, is capable of extension and retraction, and is folded up when not in use. This is the organ sometimes called the tongue of bees, although the name cannot be regarded as very appropriate, it being a part of the labium or lower lip. The other elongated parts of the mouth serve as a sort of sheath for this organ, when it is folded up. It is not tubular, and employed in the manner of suction, as was at one time supposed, but is generally more or less hairy, so that the honey adheres to it as it is rolled and moved about, and is conveyed up through the mouth into the honey-bag, sometimes called the first stomach, an appropriate receptacle, in which it apparently undergoes some change—without, however, being subjected to any process analogous to digestion, and is ready to be given forth again by the mouth, according to the habits of those species of bees which are social, as food for the members of the community that remain at home in the nest, or to be stored up in cells for future provision. See HONEY. But the mouth of bees is also adapted for cutting and tearing, and to this purpose their mandibles or upper jaws are especially appropriated. Of these, some of them, as the common humble B. (q.v.), make use to open their way into the tubes of flowers which are so deep and narrow that they cannot otherwise reach the nectar at the bottom. Others make use of their mandibles to cut out portions of leaves, or of the petals of flowers, to form or line their nests; the common hive B. uses them in working with wax, in feeding larvæ with pollen, in cleaning out cells, in tearing to pieces old combs, in combats, and in all the great variety of purposes for which organs of prehension are required. But it is not by means of any of the organs connected with the mouth that bees collect and carry to their nests the supplies of pollen needful for their young. The feathered hairs with which their bodies are partially clothed, and particularly those with which their legs are furnished, serve for the purpose of collecting the pollen, which adheres to them, and it is brushed into a hollow on the outer surface of the first joint of the tarsus of each of the hinder pair of legs, this joint being therefore very large, compressed, and of a square or triangular form—a conformation to which nothing similar is found in any other family of insects. It is also worthy of observation, that in the social species of bees, the males and the queens, which are never to be employed in collecting pollen, do not exhibit this conformation adapted to it, but only the sexually imperfect females, commonly called neuters or workers.

Bees, like other hymenopterous insects, are extremely well provided with organs of sight, and evidently possess that sense in very great perfection. In the front of the head, they have two large eyes, the surface of each consisting of many hexagonal plates, which perhaps may not unaptly be likened to the object-glasses of so many telescopes; and the faculty which these insects certainly possess, of returning in a direct line to their hive or nest, from the utmost distance of their wanderings, has been with greatest probability ascribed to their power of sight. But besides these large eyes, they have, like the rest of the hymenopterous order, three small eyes on the very top of the head, which are supposed to be intended to give a defensive vision upwards from the cups of flowers.—They are evidently, however, possessed of organs which enable them to guide their movements in the dark as accurately as in the full light of day, at least within the nest or hive; and this power is generally ascribed to the *antennæ* (q.v.), which are sometimes supposed to be not merely delicate organs of touch, but also organs of hearing, or of some special sense unknown to us. It is certain that the social bees have some means of communicating with each other by means of their antennæ; and that they avail themselves of these organs both for their ordinary operations, for recognition of each other, and for what may be called the conduct of the affairs of the hive. There can be no doubt that bees possess in a very high degree the sense of smell; and their possession

of the senses of taste and hearing is almost equally unquestionable, whatever difficulty there may be in determining the particular organs of the latter sense.—The wings of bees, like those of other hymenepterous insects, are four in number; thin and membranaceous; the hinder pair always smaller than the others; and in flight, attached to them by a number of small hooks, so that the four wings move as if they were two.

The sting of bees is a very remarkable organ. It consists of two long darts, with a protecting sheath. A venom bag is connected with it, and powerful muscles for its propulsion. The wound appears to be first made by the sheath, along which the poison passes by a groove; and the darts thrust out afterwards in succession, deepen the wound. The darts are each furnished with a number of barbs, which render it so difficult to withdraw them quickly, that bees often lose their lives by the injury which they sustain in the effort.—The males are destitute of sting.

The great family of bees is divided into two principal sections called *anārenetæ* and *apiariæ*, or *andrenidæ* and *apidæ;* the latter names, however, being sometimes employed in senses more restricted. In the first of these sections, the *ligula* is comparatively short and broad; in the second, it is lengthened, and has the form of a filament. All the *andrenetæ* live solitarily, as well as several subdivisions of the *apiariæ*. These solitary bees do not lay up stores for their own winter subsistence; but they display very wonderful and various instincts in the habitations which they construct and the provision which they make for their young. There are among them males and perfect females only, and no neuters. The work of preparing nests and providing food for the young seems, in all of the species, to be performed exclusively by the females. *Colletes succincta*, a common British species of the *andrenetæ*, affords an example of a mode of nest-making, which, with various modifications, is common to many species of that section. The parent B. excavates a cylindrical hole in the earth, usually horizontal, to the depth of about two inches, in a dry bank or a wall of stones and earth. The sides of this hole are compacted by means of a sort of gelatinous liquid, secreted by the insect, and it is occupied with cells, formed of a transparent and delicate membrane, the substance of which is the same secretion in a dried state. The cells are thimble-shaped, fitting into each other, a little space being left at the furthest end of each for the reception of an egg and a little paste of pollen and honey. The last cell being completed, and its proper contents deposited in it, the mouth of the whole is carefully stopped up with earth.—Some of the solitary bees, possessing great strength of mandibles, excavate their nests in old wood. *Xylocopa violacea*, one of the *apiariæ*, not uncommon in some parts of Europe, makes a tunnel not less than 12 or 15 in. long, and half an inch wide, which is divided into 10 or 12 cells; an egg with store of pollen and honey is deposited in each compartment, and as the lowest egg is hatched first, a second orifice is provided at that part of the tunnel, through which each of the young ones in succession comes forth to the light of day, each larva, as it is about to change into the pupa state, placing itself with its head downwards in the cell.—Numerous species of solitary bees excavate their tunnel-shaped nests in the soft pith of decayed briers or brambles, of the particles of which they also form their cells.—Some species of *megachile osmia*, etc., line them and divide them into cells with portions of leaves or of the petals of flowers. See LEAF-CUTTER BEE. Some of the solitary bees make their nests, not in the earth, but in cavities of decaying trees, or other such situations, where they construct their cells without the same necessity of excavation; but some of them, by a very admirable instinct, surround their nest with down collected from the leaves of plants, an excellent non-conductor of heat, so that a nearly uniform temperature is maintained in situations in which the changes would otherwise be great and rapid. Some bees make their little nests in old oak-galls, and there are species which appropriate empty snail shells to that use.—Some species of the genus *megachile* build their nests of a sort of mason-work of grains of sand glued together with their viscid saliva. The nest of *M. muraria*, thus constructed, is so hard as not to be easily penetrated by a knife, and very much resembles a splash of mud upon a wall.

The social bees live in communities like those of ants, which also, like theirs, consist of males, females, and neuters—these last being females with ovaries imperfectly developed, and characterized by peculiarities of form and structure, as well as of instinct and employments, remarkably different from those of the perfect females. The social bees are conveniently divided into humble bees (q.v.) and honey bees, of the latter of which the common hive B. (see the next section of this article) may be regarded as the type. Before proceeding to a more particular account of the hive B., it may be proper to remark that the species of honey B. (the restricted genus *apis*) are not few, and that they are natives of the warm parts of the old world: the hive bees (*apis mellifica*) which now abound in some parts of America, and which have become naturalized in the forests to a considerable distance beyond the abodes of civilized men, being the progeny of those which were conveyed from Europe. The hive B. is said not to have been found to the w. of the Mississippi before 1797, but in fourteen years it had advanced 600 m. further in that direction. The different species of honey B. in a wild state generally make their nests in hollow trees, or among the branches of trees, sometimes under ledges or in clefts of rocks; and their stores of honey are not only sought after by man, but afford food to numerous animals, some of which equally delight to prey upon their larvæ. The B. was amongst the ancient Egyptians the hieroglyphical emblem of royalty.

The B. domesticated or cultivated in Egypt, is not, however, our common hive B., but another species called *apis fasciata;* and in Italy and Greece a species called *A. ligustica* is employed, which has been recently introduced into England, and is now domesticated at the B. house of the apiarian society, Muswell hill, near London. These species differ little from the common hive B., and their honey is very similar; but that of some species is considerably different. *A. unicolor*, of Madagascar and the Isle of France, yields an esteemed honey of a green color. It is domesticated, or is the object of human care and attention there, as are also *A. Indica* in some parts of India, and *A. adansonii* in Senegal. We regret that our limits do not permit us to give a particular account of any of these species.—The genus *melipona* is nearly allied to *apis*. The species are natives of South America, and their honey is extremely sweet and agreeable, but very liquid, and apt to ferment. They make their nests in the cavities or on the tops of trees.

The Hive Bee.—Natural History.—The instincts and social economy of the HIVE B. (*apis mellifica*) have been studied with great attention both in ancient and modern times, and discoveries—than which, perhaps, nature presents nothing more interesting and wonderful—have rewarded the patient observations of Huber and others who have devoted themselves to this subject. *Apiarian societies* have been formed for the purpose of prosecuting this single branch of natural history, and of promoting successful apiculture, or the economical keeping of bees.

The hive B. is probably not a native of Britain, and may even have been brought to Europe from the east. Its communities seem ordinarily to number from 10,000 to 60,000 individuals, and there appears no reason to think that the care bestowed upon the insect by man, or the *hives* which he has provided for it, have made any important difference in this respect. One member of each community is a perfect female—the queen or mother B.; from 600 to 2000 at certain seasons are males; and the remainder are *neuters* or workers, the real nature of which has been explained in the previous part of this article.

The workers have a body about half an inch in length, and about one sixth of an inch in greatest breadth, at the upper part of the abdomen. The antennæ are twelve-jointed, and terminate in a knob. The abdomen consists of six joints or rings, and under the scaly coverings of the four middle ones are situated the *wax-pockets* or organs for the secretion of wax. The extremity of the abdomen is provided with a string, which is straight. The basal joint of the hind tarsi is dilated to form a pollen-basket, and the legs are well provided with hairs for collecting the pollen and brushing it into this receptacle.—The males or *drones*, so called from the peculiar noise which they make in their flight, are much larger than the neuters, and thicker in proportion. The antennæ have an additional joint. The eyes are remarkably large, and meet upon the crown.—The perfect females are considerably longer than either the workers or males; they are also distinguished by the yellow tint of the under part of the body, and very remarkably differ from all the other inmates of the hive in the shortness of their wings, which, instead of reaching to the extremity of the abdomen, leave some of its rings uncovered. —Neither males nor queens have wax-pockets, nor have they pollen-baskets. Their legs also are less hairy. The sting of the queen B. is curved. The mandibles both of the males and perfect females are notched or toothed beneath the tip, which those of the workers are not.—It will be seen from this brief description that the sexes differ so widely as to appear, if the contrary were not well known, insects of different species; but still more remarkable is the difference between the females and the workers when we consider that it is all to be ascribed to the different forms of the cells in which the eggs are hatched and the young bees reared, and to the different kinds of food with which they are supplied. All doubt upon this point is removed by the interesting discovery of Schirach, that when a hive is deprived of its queen, the bees provide themselves with another, if there are eggs or very young larvæ in the cells appropriated to the breeding of workers; proceeding immediately to transform, for this purpose, one of these cells, and sacrificing, without scruple, the eggs or larvæ in the cells adjoining that selected for transformation and enlargement. These are facts well ascertained, but of which science has yet been unable to give any explanation.

The greater part of the life of the queen or mother B. is spent in laying eggs for the increase of the population of the hive; and this increase goes on at a rapid rate, as the queen not unfrequently lays 300 eggs in a day. The number, however, varies greatly. In cold weather it is very small, but the invariable presence of brood in different stages, in a well-stocked hive, proves that some eggs are laid even in winter. During the later spring months the number is very great; many practical apiarians considering that as many as 1000, or even 2000, are deposited daily. The community, however, is not destined to an indefinite increase; but in certain circumstances, *swarming* takes place, and new colonies are founded.

The impregnation of the queen takes place in the air, and usually within a few days after she herself has emerged from the cell. It is the only occasion of her ever leaving the hive, except that of swarming, and there is no repetition of it during her whole life. The question has therefore been asked, why there are so many males in a B. community; but no very satisfactory answer has been given to it. The males are not known to fulfill any other purpose than that of the propagation of their species; and after the swarming season is over, the greater part of them are ruthlessly massacred by the workers, as if in

dread of their consuming too much of the common store. The greater part of the workers themselves are supposed scarcely to live for a year; the duration of the life of queen bees is often more than three years.

The queen B., when about to begin to lay eggs, is the object of great attention on the part of the workers, and so continues. She moves about in the hive, attended by a sort of retinue of about 10 or 15 workers, by some of which she is frequently supplied with honey. But the name of queen B. appears to have originated in a mistaken notion that something analogous to a monarchy subsists in the bee-hive; and imagination being permitted very free scope, many things have been invested with a false coloring derived from this analogy. The queen or mother B. appears to be the object of particular regard, as indispensable to the objects for which the B. community subsists, and to which the instincts of all its members are variously directed. She moves about, depositing her eggs in the cells which the workers have prepared, and they are ready to take charge of each egg from the moment that it is deposited. Her employment requires that she should be fed with food collected by others, and many of the workers are in like manner supplied with food whilst busy within the hive, as well as the larvæ in the cells; but there is no evidence whatever of anything like authority exercised by the queen, or, indeed, of any superiority of one over another in the whole multitude.

The queen B. at first lays eggs which give birth to workers, and afterwards there takes place a laying of eggs which become drones. With unerring instinct, she places each egg in the kind of cell appropriate to it; whilst also, at the proper time, cells of the proper kind are prepared beforehand by the workers, the drones' cells being larger than the workers' cells. The cells in which future queens are to be reared are very unlike all the others, but the eggs differ in no respect from those deposited in workers' cells. It is a curious circumstance, that queens, of which the fecundation has been prevented till they are considerably older than usual, lay only drone eggs. It occasionally also happens that some of the worker bees lay eggs, and these invariably produce drones.

The eggs of bees are of a long shape and bluish-white color, about one twelfth of an inch in length. They are hatched in about three days. The larvæ are little worm-like creatures, having no feet, and lying coiled up like a ring: they are diligently fed by the working bees, until, in about five days, when large enough nearly to fill the cell, they refuse food, upon which the attendant bees seal up the cell with wax, and the larva, spinning itself a fine silken envelope or cocoon, is transformed into a pupa; and about the 18th day—or, in the case of drones, the 24th day—from the deposition of the egg, the young B., in its perfect state, breaks the covering, and issues from the cell. It is caressed and supplied with food by the attendant bees, and is believed not to try its wings until the following day. The cell from which a young B. has issued is speedily cleaned out, and prepared for the reception of another egg or of honey. The fine silken envelope of the pupa, however, remains attached to the cell, of which the capacity thus becomes gradually smaller, until the cells of old combs are too small to receive eggs, and can be used for honey alone, a fact of which the importance in relation to the economical management of bees is obvious.—The spinneret, by means of which the larva spins the cocoon, is a small organ connected with the mouth.—The food with which the larvæ are supplied is a mixture of pollen, honey, and water, with the addition, possibly, of some secretion from the stomachs of the working bees, in which it is prepared. It varies a little, according to the age and kind of the larva, and the peculiarities of that given to young queens appear to be indispensable to their fitness for their future functions. Pollen is constantly found stored up in the cells of the hive, and is often called bee-bread. Most people have met with such cells in honey-comb, and have observed the bitter and peculiar taste of the contents.

The combs of a bee-hive are parallel to each other, forming vertical strata of about an inch in thickness, and distant about half an inch from each other. The cells are therefore nearly horizontal, having a slight and somewhat variable dip towards the center of each comb. The central comb is generally first begun, and next after it those next to it on each side. Circumstances frequently cause some departure from this uniform and symmetrical plan, which, however, still remains obvious. Each comb consists of two sets of cells, one on each side; and it may be mentioned as an illustration of the wonderful industry of bees, and the results of their combined labors, that a piece of comb, 14 in. long by 7 in. wide, and containing about 4000 cells, has been frequently constructed in 24 hours. The greater part of the comb usually consists of the kind of cells fitted for breeding workers, a smaller part of it of the larger or drone cells. After the principal breeding-season is over, the cells of some parts of the comb are often elongated for the reception of honey; and sometimes comb of greater thickness, or with unusually long cells, is constructed for that purpose alone, in which case the mouths of the cells are inclined upwards, more than is usual with the ordinary brood-cells. When a cell has been completely filled with honey, its mouth is *sealed* or covered with wax.

It is impossible to look at a piece of comb taken from a bee-hive, without admiring, not only its beauty, but the perfect regularity of the size, form, and arrangement of the cells; and the more carefully that it is examined, the more must it be admired. For in it are practically solved, by an instinct which can only be referred to the infinite wisdom of the Creator, some problems difficult to human science, particularly in the combination of the greatest economy of materials and of space, with the most perfect convenience

and the greatest strength. It appears even at a glance, that the cells are hexagonal or six-sided, the hexagons perfectly regular, and in this way there are no interstices between the cells. Now, the mathematician knows that there are only three regular figures, that is, figures of which all the sides and angles are equal, bounded by straight lines, with which a space can be perfectly filled up in this way—the equilateral triangle, the square, and the hexagon; and of these the hexagon is at once the most suitable for the larva of the B. in its form, and the strongest in its nearest approach to the circle. The circular form itself would have left large interstices. But this is not all: the same wisdom which has given the solitary bees, already noticed, their instinct to surround their nest with a cottony substance, which serves as a non-conductor of heat, has directed the hive B. to the constant adoption of a mode of constructing its combs, which adds greatly to the strength they would have possessed with the same amount of materials, if the cells had been merely regular hexagonal prisms, and the partition in the middle of the comb, between the cells of the one side of it, and those of the other, therefore a simple plane. It is so far from being so, that when carefully examined, it appears, if the expression may be used, the most ingenious part of the whole structure. It is composed of a multitude of little rhombs, or four-sided figures, with equal and parallel sides, and two obtuse and two acute angles, the obtuse angles being invariably angles of 109° 28′, and the acute angles of 70° 32′, agreeing precisely with the results of mathematical analysis, applied to the difficult question of the form of the facets of a three-sided pyramid, which should terminate a six-sided prism, so as to combine the greatest economy of materials with the greatest strength. On looking at a piece of empty honey-comb, placed between the eye and the light, we readily perceive that the cells are not opposite to each other, cell to cell; but that the point of meeting of three sides of three cells, on one side, is opposite to the center of a cell on the other side—a circumstance which of itself we cannot but regard as calculated greatly to increase the strength of the whole fabric. It follows also from this, that the terminating pyramids of the cells on the one side do not interfere with the form of the cells on the other side, but the three rhombic facets, which terminate each cell, belong likewise to three distinct cells on the opposite side of the comb.

The only departure from perfect regularity in the form of the cells, is in the transition from the smaller or workers' cells to the larger or drones' cells, which, when it takes place, is managed with great simplicity and beauty of contrivance. Our limits, however, do not permit us to enter further into this subject.

The material of which the cells are built is chiefly wax (q.v., and see Bees-Wax), which is at first of a white color, but becomes brownish-yellow with age, and in very old combs, almost black. Although wax exists as a vegetable product, yet bees-wax is now known to be produced by a chemistry which is carried on in the bodies of bees; and it has been found that they produce wax and build combs when supplied only with honey or saccharine substances. The *wax-pockets* in the abdomen of working-bees have been already referred to. The bees which are about to proceed to wax-making, suspend themselves in clusters in the hive, attaching themselves to each other by means of hooks with which their feet are provided; and whilst they remain motionless in this position, the wax appears to be formed, in small scales, which they afterwards take in their mouths and curiously work up with a secretion from the mouth itself, passing the wax, in the form of a minute riband, through the mouth, first in one direction and then in the opposite one, and finally depositing it in its proper place for the foundation of the comb. One B. always begins the comb alone, the rest, in gradually increasing numbers, proceed in accordance with what has been already done. The bees which elaborate and deposit the wax, do not, however, construct the cells, which is done by others, partly at least by a process of excavation in the wax deposited. It is supposed by many naturalists, that some of the working-bees are exclusively wax-workers, some nurses, etc.; but others think that there is only one class of working-bees, all ready for any kind of work according to circumstances.

But wax, although the chief, is not the only material of the combs. *Propolis* (q.v.) is also employed in small bands to give greater strength to the cells, the mouths of which are surrounded with it, and made thicker than their walls. This substance, which is obtained by bees from the viscid buds of trees, is also employed for more firmly attaching the combs to the hive, for closing up apertures in the hive, for covering up obnoxious substances, intruding slugs, etc., which are too large to be removed, and for a variety of similar purposes.

It has been already stated that queen-bees are hatched and reared in cells different from the rest. They are, indeed, very different, being vertical and not horizontal in their position—not hexagonal, but rather oval in form—and much larger than the other cells, even in proportion to the size of the animal that is to inhabit them: they are generally placed on the edge of a comb, and when they have served their purpose, are partially removed, so that during winter they resemble acorn-cups in appearance.

Two queens cannot exist in the community together. There is implanted in them the most deadly rivalry; and the mother-bee, if permitted, would even tear open every queen cell of which the inmate has nearly approached maturity, and inflict death by her sting. One of those wonderful instincts, however, with which bees are endowed, counteracts this at those times when, upon account of the increased numbers of the

community, and in order to the formation of new colonies, it is requisite that it should be counteracted. The workers throng around the queen, hem her in, and prevent the execution of her purpose. The cell of the young queen is also carefully guarded, and she is not permitted to leave it. At such times peculiar sounds, produced probably by the action of the wings, are emitted both by the actual queen under restraint in her movements, and by the young one in the cell, which may be heard by an ear applied to the outside of the hive, and are familiar to B. cultivators as one of the surest signs of swarming. The queen now becomes restless; her agitation communicates itself to those around her, and extends through the hive; the ordinary work of the community is in great part neglected; fewer bees than usual are seen to leave or return to the hive; and at last the queen-bee rushes forth, preceded and followed by crowds which press and throng upon each other, form a buzzing cloud in the air, and very generally settle upon a bush in the neighborhood, where they soon congregate closely together, hanging by their claws in a dense cluster. Sometimes they rise up in the air, and fly off at once to a considerable distance, apparently to some previously selected place in the thick top of a tree—in the chimney or roof of a house, where they happen to find an aperture—or in some such situation. More frequently, they settle not far from the hive which they have left, often on some very humble plant, or even on the grass, and soon rise again. It is the care of the cultivator to prevent this by providing them immediately with a suitable habitation in a new hive, invitingly placed above them, or into which he puts the swarm after they have congregated closely together as above described. It sometimes happens that bees hurry out of their hive without their queen, in which case they do not in general congregate so closely together where they settle, and soon return to the hive again. Swarming generally takes place on a fine day; and when the bees seem on the very point of *coming off*, a cloud passing over the sun is enough to retard it. Bad weather occasionally not only retards but prevents it, the young queens being at last killed in their cells.—When the first swarm of the season has left the hive with the old queen, as is usually, if not always the case, the imprisoned young queen is set at liberty; and if the B. community is a large and prosperous one, other young queens also come forth from their cells, and leave the hive with successive swarms, the number of which depends upon the climate, the season, etc. In Britain, it is not uncommon for a bee-hive to send off three swarms in a summer, the first being almost always the largest, and not unfrequently itself sending off a swarm before the season is over.

Bees left without a queen, and with no means of supplying the want, appear to feel themselves cut off from the very purpose of their existence; the labors of the community are relinquished, and its members are dispersed and die. It has already, however, been stated, that bees left without a queen can provide themselves with one, by transforming and enlarging a worker's cell which contains an egg or very young larva. This process is sometimes carried on as if by several distinct parties, in different parts of the hive at once; and as if aware that time will be gained, the bees generally prefer cells containing larvæ of two or three days old to those containing eggs.

Bees become partially torpid during cold weather, consuming much less food than they would otherwise require. They are readily aroused from this state, however, as may at any time be proved by tapping on a bee-hive, when it will be found that the temperature of the interior of the hive rises rapidly. Respiration is considerably lessened in the state of partial torpidity, and the temperature rises when it is resumed. The respiration of bees takes place by air-tubes or *tracheæ* (see INSECTS), and is very active when the insect is in a state of activity. The respiratory movements are easily seen in looking at a bee. The consumption of oxygen by this process might be expected soon to reduce the atmosphere within a hive to a state in which it could no longer support animal life; but in summer, when respiration is active and the hive populous, a constant circulation of air is maintained by the insects themselves, some of which are employed in a rapid vibration of their wings for this purpose. A greater or smaller number of them, according to circumstances, may frequently be seen thus engaged in fanning the air at the mouth of a bee-hive.

It may well be deemed an extraordinary fact, that among the enemies of bees are to be reckoned certain species of moth, which, notwithstanding the danger of the stings of the bees, enter the hives and deposit their eggs. After the eggs are hatched, the larvæ feed upon the combs. Mice sometimes eat their way into the hives in winter, and destroy and plunder unmolested.

Bees are sometimes very destructive to each other in their combats, as when one B. community is assailed by others for the purpose of plunder. To this the weaker communities are liable, particularly when flowers are few, and bees are awakened to full activity in the warm days of early spring. The narrower that the entrances of bee-hives are at this season, at least of the less populous hives, the less likely is the B. owner to suffer loss from this cause, as the narrow entrance is more easily defended even against very numerous invaders.

Management of Bees.—We do not think it necessary to enter largely into the subject of *apiculture*—the cultivation or management of bees.

It is, of course, necessary that the *apiary* or stock of bee-hives should be situated in a neighborhood where flowers sufficiently abound for the supply of honey. It is, however, by no means certain to what distance bees roam. Some authors mention

one mile as the probable distance; but the opinion has apparently been hazarded on mere conjecture, and there seem to be good reasons for supposing that a much greater distance might more correctly be named. But whatever distance bees may be capable of traveling in quest of honey, it is undoubtedly of great importance that they should have good feeding-ground in the immediate neighborhood of the apiary; and in many parts of the world, the practice prevails of removing them from place to place, according to the season, in order that advantage may be taken of the greatest abundance of flowers. Thus in the s. of Scotland, bee-hives are very frequently removed to heath-covered tracts in the beginning of August, and remain there till the heath is out of flower; and this affords in many parts of the country the most plentiful honey-harvest, although in other parts, especially where white clover abounds, the greatest quantity of honey is obtained earlier in summer. The difference between *heather honey* and *flower honey* is well known in Edinburgh. No small number of bee-hives from that city and its immediate vicinity are annually conveyed for a few weeks to the Pentland hills. The conveyance of bees "to the heather" is generally accomplished either by a handbarrow or a spring-cart of easy motion, so that the combs may not be displaced by shaking; and the mouth of the hive is carefully closed with a plate of perforated zinc, or other contrivance for keeping in the bees and permitting circulation of air. Fifty or one hundred bee-hives may often be seen collected in one place, and under the care of one person, during the heather season.—In Egypt, far greater numbers of hives (of *apis fasciata*), are often kept in a single vessel on the Nile, and are conveyed from place to place on the river, according to the succession of flowers in the different districts. A somewhat similar practice prevails on the Rhone; and the transporting of bees (*apis ligustica*) from pasture to pasture has been usual in Greece, in Asia Minor, and in Persia, from remote antiquity.

As to the form of bee-hives, and the material of which they should be made, there are great differences both of opinion and practice. Glass hives, and hives with glass windows, which can be covered at pleasure with wooden slides, are employed by those who wish to observe the movements and habits of bees; but for profitable purposes, wood and straw are in Britain the only materials in common use. For the material of a hive, wood has the advantage over straw in its greater neatness and durability; but there is a disadvantage in the greater likelihood that, unless shaded from the sun, portions of the comb may be so much melted as to fall in hot weather. In some parts of Europe, cylindrical cork-hives are much used, made by removing the wood of a portion of the cork-tree, and leaving the bark uninjured; and hives of earthenware are common in Greece and Turkey. The form of hives is of little consequence; but it is important that the owner should have facilities for giving increased room both above and below the stock-hive: increased room above is required for the reception of pure honey-comb unmixed with brood, and the capability of adding to the hive below, by raising it up an additional story, is often requisite to prevent swarming, which is incompatible with the collection of a large store of surplus honey.

Bees require attention at the time of swarming, that they may not fly away and be lost. They require also to be fed during winter, when, on account of a bad season, the lateness of the swarm, or other cause, they have not enough of honey to support them. A common rule is, that the weight of the contents of the hive must be at least 20 lbs., that the bees may survive the winter without being fed; and even in this case a supply of food for a short time in spring promotes the activity of the bees, and their summer prosperity. The food ordinarily supplied to bees is either the coarser kind of honey, or sugar and water. Strong ale and sugar boiled are also frequently given as food. The practice has very largely prevailed in Britain and elsewhere, of killing bees by fumes of sulphur, in order to take from them their honey in the end of autumn, a portion only of the increase of the stock being kept through the winter. This practice still has its advocates; but many now take only what they can by top boxes or *supers*, or by cutting out combs, preserving all hives which are not so light that there is no good hope of their surviving the winter. It may be doubted if, in almost any part of the country, the number of bees kept is so great as nearly to exhaust the floral resources, and in all probability this may yet become a much greater source of wealth than it is in Britain.

When honey is to be taken from bees, the person doing it must be carefully protected from their stings by gloves, veil, etc. It is best done during the heat of a fine day, when the bees more readily leave the combs of the *super* that is taken away, and return to their hive. A little gentle tapping generally causes them to leave the combs, and a feather is used for brushing off those which are slow to do so. The smoke of the common puff-ball (q.v.) causes them to fall down in a stupefaction from which they speedily recover, and its use is very convenient. It is gathered and dried for the purpose. Chloroform is also sometimes used for the same purpose, but the effect is apt to be fatal, unless care is taken to choose the morning of a fine day, so that the stupefied bees may have time to recover in the air and sunshine.

Bees are much less apt to sting when swarming than at other times, and in general all the necessary operations are performed without gloves or veil, and with perfect safety. The sting of a B. is to many persons a thing of no great consequence, although, in some, it causes great local inflammation and swelling, and general derangement of

health. The application of a little ammonia usually relieves the pain; or an onion cut through the middle; or the common "blue-bag" of a washer-woman.

The apiary should, if possible, be in a sheltered place, and where it enjoys a good amount of sunshine. The hives are very generally placed at small distances in the open ground, but some bee-keepers protect them by a shed. In the former case, each hive is usually covered with a straw-hood in winter, to keep away the rain, as damp is particularly injurious to bees. For the avoidance of damp, and to prevent the bees from coming in contact with the ground when they hang in a great cluster at the door of the hive—as they often do before swarming, when the weather is hot, and the hive very populous—each hive is raised to a height of at least 15 or 18 in. from the ground.

BEES, LAW RELATING TO. Bees are stated by Blackstone to be wild by nature (*feræ naturæ*), but when hived and reclaimed, are regarded in the nature of *property* belonging to the person on whose ground or soil they have swarmed; and in support of this doctrine he refers to the charter of the forest, 9 Henry III. c. 113, which allows every freeman to be entitled to the honey found within his own woods. The qualified property which may be thus held in bees continues while the swarm remains on the soil; and in the event of flight, so long as the owner can pursue it. Indeed, so clearly are they considered in law to be of the nature of property, that it has been decided in England that bees may be the subject of larceny (q.v.)

The same appears to be the Scotch law. Mr. Erskine, who may be described as the Scottish Blackstone, founding on the Roman law, lays down that when bees have abandoned their hive, not being observed and followed, they are understood to have recovered their original liberty; and if they light on the grounds of another, and are inclosed by him in a new hive, they become his property. See OWNERSHIP.

BEE, HUMBLE. See HUMBLE-BEE.

BEE, a co. in s. Texas, on the Arkansas river; 900 sq.m.; pop. '70, 1082—69 colored; a level, sandy, cattle-breeding region. Co. seat, Beeville.

BEECH, *Fagus*, a genus of trees of the natural order *cupuliferæ* (q.v.). The male catkins are almost globose, stalked, their flowers consisting of a bell-shaped 5 to 6-cleft perianth and 8 to 15 stamens. The female flowers, which grow on the same trees, consist chiefly of a germen with three awl-shaped styles, and are situated two or rarely three together within a stalked involucre, which bears on its outer surface many fleshy threads. This involucre, after the flowering is over, closes and forms a husk resembling a sort of capsule, which when ripe opens in four valves, is externally covered with soft spines, and incloses one or two (rarely three) triangular nuts, which bear the name of *beechmast*. —The species are not numerous; all of them are forest trees of great beauty.—The COMMON B. (*F. sylvatica*) forms whole forests in many parts of Europe. It grows to a height of 100 to 120 ft., and a diameter of 4 ft.; and particularly when standing alone becomes a very ornamental tree with far-spreading branches, which often droop gracefully almost to the ground. It has thin, ovate, obscurely toothed leaves, finely ciliated on their margins. Its bark is smooth, often of a whitish color; and it is remarkable for the frequency with which hard wooden knobs—abortive branches—occur in its bark. Grass does not grow readily under the shade of the B., but in B. woods may sometimes be found rare plants almost peculiar to such situations. The B. thrives best in light soils; and does not send its roots deep into the ground, but rather horizontally under the surface. The wood is more or less of a reddish-brown color, as the tree has grown in a dense forest, or has been freely exposed to sun and air. It is very hard and solid, but brittle; and when exposed to the open air, very liable to rot and to be eaten by worms. It is therefore not adapted to the purposes of the house-carpenter; but when kept always under water, it is very durable, and is accordingly employed in the erection of mills, and for weirs, sluices, etc. It is also employed for many purposes by cabinet-makers and turners. It is very much used in France for making the *sabots* or wooden shoes of the peasantry, being preferred for this purpose to every other wood except walnut, on account of its property of not absorbing water. It is one of the best kinds of firewood in Europe. Its ashes yield much potash and of excellent quality. The raspings of the wood are used in the preparation of vinegar. See VINEGAR and PYROLIGNEOUS ACID. The bark is sometimes employed for tanning when oak-bark is scarce. The B. bears lopping well, and is often planted for hedges; and it is a curious fact that when it is prevented from attaining a tree-like size, and is kept closely pruned, the withered leaves remain on the branches all winter, which is not the case in other circumstances. In some countries, as Dauphiny and Switzerland, the leaves of the B. are collected in autumn before they have been much frost-bitten, and are used for making beds or mattresses.—Beechmast, when fresh, has a sweet taste, like that of a walnut. It contains in large quantity a bland fixed oil, along with a starchy farina, a little sugar, and an astringent substance. A volatile, narcotic, poisonous principle, called *fagine*, is also found in it; but more in the rind than in the kernel: and when not only the smooth leathery outer rind, but also the thin brown inner pellicle have been removed, it is wholesome food. It is, however, more generally used for feeding swine, poultry, etc., and is much employed in France and other parts of Europe for the manufacture of *beech oil*, which, when expressed without the application of heat, and well clarified, has an agreeable taste, is fit for use as food, and keeps long without becoming rancid. When less pure,

it is used for lamps and in the arts. The oil-cake which remains is good food for poultry, for swine, and even for oxen, but is injurious to horses. Many manufacturers of cocoa adulterate it with beechmast, first depriving the cocoa of its oil, which they sell separately as cocoa-butter, and trusting to the oil of the B. for supplying its place.—B. forests anciently abounded in England, and great herds of swine were fed in them. The B. is not, in general, found in Europe n. of lat. 59°, although it occurs 2° further n. in the Scandinavian peninsula. It is found in the temperate parts of Asia and in North America; the WHITE B. of that country being generally regarded as the same species, a very common tree in some parts of the United States. In gardens and pleasure grounds a variety is very frequently to be seen, of which the leaves have a blood-red color. The same color appears also in some degree in the leaves of the RED B. of North America (*F. ferruginea*), which is distinguished by elongate-ovate, coarsely serrated, and much acuminated leaves. It forms extensive forests in the n.e. states and the adjoining British possessions; and its wood, which is of a somewhat red or rusty color, is more valued than that of the white B.—Two species of B. are found on the mountains of Java; four are natives of the more elevated parts of the s. of New Zealand; several belong to the s. of South America. The genus is, in fact, more characteristic of the colder latitudes of the southern than of the northern hemisphere. *F. betuloides* (also known as *F. Forsteri*) is the "myrtle tree" of the mountains of Tasmania—a very large tree with evergreen leathery leaves, in form much resembling those of the birch, although the general habit of the tree agrees with that of other beeches. The same species is the evergreen B. of Terra del Fuego, where it forms forests of which the dark-green foliage contrasts strikingly in winter with the dazzling snow. There can be little doubt that it will soon become a favorite and common ornamental tree in Britain. The wood is too heavy and brittle for masts, but makes tolerable planks, and is carried to the treeless Falkland islands for roofing houses. *F. Antarctica* ascends higher on the mountains about the strait of Magellan. It has deciduous leaves, and much resembles the common B.—*F. procera* grows in the Andes of Chili, and attains a majestic size. It is a valuable timber tree.

BEECH-DROPS. See CANCER ROOT.

BEECHER, the name of a celebrated American family of preachers and litterateurs.

LYMAN B. was b. at New Haven, Conn., U. S., Oct., 1775. He devoted himself to theology; and after holding the pastorate of Congregationalist churches at Litchfield and at Boston, he was in 1832 appointed president of the newly founded Lane theological seminary near Cincinnati. He died at Brooklyn in Jan., 1863. He was a powerful preacher and platform orator.—His son EDWARD, b. in 1804, became distinguished as a theologian.—Another son, HENRY WARD B., was b. at Litchfield, Conn., in 1813, and after graduating at Amherst college, Massachusetts, studied theology under his father at Lane seminary. After ten years' pastorship of two churches in the state of Indiana, he removed to Plymouth church, Brooklyn, N. Y., "an organization of Orthodox Congregational believers," where he still remains. He is said to have the largest congregation in the United States, and his popularity as a pulpit speaker and as a lecturer speedily became prodigous—owing partly to his rich fund of illustration, his dramatic manner, and his keen sense of humor. For nearly 20 years B. was editor of the *New York Independent*, a religious newspaper; in 1870 he became editor of the *Christian Union*, a similar publication. Intense interest was shown when in 1875 B. was tried for adultery. The jury were unable to agree on a verdict, the majority inclining to acquit him. B.'s influence is said hardly to have suffered, and the fidelity of his congregation is unshaken. His sermons known as the *Plymouth Pulpit*, his *Lectures to Young Men*, *Life Thoughts*, *Life of Christ*, and *Yale Lectures in Preaching*, have been largely read here and at home. He has visited Europe twice, last in 1864.

CATHERINE B., eldest daughter of Lyman B., was b. at East Hampton, L. I., in 1800. From 1822 to 1832, she was principal of a female seminary at Hartford, Conn., and afterwards of a similar institution at Cincinnati. She is a fertile and popular writer, chiefly on subjects coming within the sphere of her own sex, but also on physiology, theology, mental and moral philosophy, etc.

HARRIET B. See STOWE, H. B.

BEECHER, CATHERINE ESTHER (*ante*), 1800-78; b. N. Y.; eldest child of Lyman. Her mother died when C. was about the age of 16, and for two years she had the care of her father's house at East Hampton. When she was about 19 years old she was engaged to prof. Fisher, of Yale college, but he was lost in shipwreck on a voyage to Europe, and she remained unmarried. In 1822, she began a school at Hartford, Conn., and kept it until 1832, when she went with her father to Ohio, and opened a seminary for young women in Cincinnati, but was compelled to give it up two years later on account of ill health. She made it the business of her life to improve and advance the intellectual, physical, and practical education of women. She organized societies and schools for training teachers and sending them to new states and territories. In pursuit of this object she published *Domestic Service*, *Duty of American Women to their Country*, *Domestic Receipt Book*, *True Remedy for the Wrongs of Women*, *Letters to the People on Health and Happiness*, *Physiology and Calisthenics*, *Religious Training of Children*, *The American Woman's Home*, etc. She also published *Common Sense applied to Religion*,

Truth Stranger than Fiction, a memoir of her brother George, and *Appeal to the People as the Authorized Interpreters of the Bible.*

BEECHER, CHARLES, b. Conn., 1815; fourth son of Lyman; ordained in 1844, and became Congregational pastor in Newark, N. J., and afterwards in Georgetown, Mass. He assisted Henry Ward B. in the compilation of *Plymouth Hymns and Tunes*, and has published *The Incarnation, Review of Spiritual Manifestations, Pen Pictures of the Bible*, and, jointly with Mrs. Stowe, *Sunny Memories of Foreign Lands.*

BEECHER, EDWARD, D.D. (*ante*), b. 1804; second son of Lyman; graduate at Yale, and in theology at Andover; Congregational pastor in Boston from 1826 to 1831; in the latter year president of Illinois college, where he remained 13 years, and in 1844 was again in Boston, pastor of Salem street church. In 1856, he became pastor of the Congregational church at Galesburg, Ill. About eight years ago he retired from the ministry and removed to Brooklyn, where he now resides. Dr. B. has written on the theme that man is in a progressive state, the present being the outcome of a former life, and a preparation for one to succeed after death; that the struggle between good and evil will not end with this life, but in some future era all conflicts will be ended, evil will disappear, and harmony become established. These views are set forth in *The Conflict of Ages*, and *The Concord of Ages*. He has also published a work on Baptism, and one entitled *The Papal Conspiracy.*

BEECHER, HENRY WARD (*ante*), b. Litchfield, Conn., June 24, 1813; third son of Lyman; a graduate of Amherst college and of Lane theological seminary. He began his pastoral work over a small Presbyterian church in Lawrenceburg, Ind., in 1837; and in 1839 was settled at Indianapolis. In 1847, he was called to take charge of "Plymouth church," a new Congregational organization in Brooklyn, N. Y., where he has continued until the present time, a third of a century. Mr. B. soon became one of the most popular, as he was one of the most effective, pulpit speakers, and the growth of his congregation was unprecedented in church history in this country. There are at present (1880) nearly 3000 members, and the congregation has a good proportion of the intellectual, social, and financial force of the city. H. W. Beecher was a writer before he came to the pulpit, and his pen as well as his voice has been constantly active. He was, in 1837, editor of a journal in Cincinnati, and while preaching in Indianapolis he took charge of an agricultural publication, his papers being afterwards issued in a volume called *Fruit, Flowers, and Farming*. As soon as he came to Brooklyn he began, and continued for nearly twenty years, to write for *The Independent*, and was for two years its editor, 1861–63. His well known signature (a star, *) suggested *The Star Papers*, made up of select contributions to *The Independent*. About ten years ago he became, and is now, the editor of *The Christian Union*, published weekly in New York. As a preacher he is known perhaps more generally among the people than any other occupant of a pulpit in this country, and not only citizens but strangers make it a point to attend his church, which, though one of the largest in America, is almost always full when he is to preach. As an orator he is original in manner and matter, avoiding most of the routine and conventionalism of the ordinary service, and addressing himself as a man to his fellow. He brings in all manner of topics and illustrations, and sometimes ventures so near to the comic that laughter is scarcely restrained. As a lecturer he has had a long and successful career. In the long conflict with slavery he was an early and an earnest soldier, and from the pulpit of Plymouth church came many of the severest denunciations of human chattel-hood. Nor have other questions been neglected; temperance has had his earliest support, and politics are not ignored, for it is his belief that all things which concern the welfare of the people and the country are fit subjects for the public teacher. In his fierce denunciations of injustice he is singularly free from uncharitableness toward persons. Though a man of peace, he is enough of a soldier to don the uniform and appear on parade as the chaplain of a regiment. Of his more personal tastes, it may be said that he is fond of domestic and rural life, a student of nature, a lover of animals, flowers, and gems, and a judge and patron of art. During the civil war he visited England, and took especial care to enlighten the people as to the real issues and purposes of our great struggle, thereby materially aiding in the similar work undertaken by archbishop Hughes, Thurlow Weed, and others. For twenty years his sermons have been taken down in shorthand and printed, comprising now more than a dozen volumes, known as *The Plymouth Pulpit*. Among other works of his are *Lectures to Young Men, Industry and Idleness, Life Thoughts, Sermons on Liberty and War, The Plymouth Hymns and Tunes, Norwood* (a novel), *Yale Lectures on Preaching, The Life of Christ, Sermons from Published and Unpublished Discourses*, etc. Mr. B. is of stout build, florid, and of strong physical constitution. Recently he has built a charming residence at Peekskill on the Hudson, which he occupies during a large part of the summer.

BEECHER, LYMAN, D.D. (*ante*), b. New Haven, Oct. 12, 1775; d. Brooklyn, Jan. 10, 1838; descended from one of the New Haven colony of 1638. He lost his father when an infant and was adopted as a son by Lot Benton; graduated from Yale in 1797, and next year became pastor of the Presbyterian church at East Hampton, Long Island, and there married Roxana Foote, who increased their slender means by teaching school. Mr. B.'s sermon on the death of Alexander Hamilton (killed in a duel with Aaron

Burr in 1804) gave him immediate fame that rapidly increased until he was recognized as one of the foremost preachers in the country. In 1810, he went to Litchfield, Conn., where he was pastor of the Congregational church sixteen years. In 1814, he delivered and printed a series of sermons in favor of temperance, which added greatly to his reputation for eloquence and power. He was also foremost in the Unitarian controversy which pervaded eastern New England. In 1826, he became pastor of the Hanover street Congregational church, Boston. In 1832, he became president of Lane theological seminary, a new institution near Cincinnati, O., and held the office for twenty years, during ten of which he was pastor of the second Presbyterian church in Cincinnati. In 1835, he was tried by his presbytery for teaching false doctrines, but was acquitted on appeal to the synod. When the Presbyterian church separated, he went with the new school branch. In 1852, he returned to Boston, intending to revise and publish his writings, but his mental powers faded, and not very long afterwards he retired from public work. He was married three times, and had thirteen children, of whom all but three are now living (1880). George, a clergyman, was killed in 1843 by the accidental discharge of his gun. Dr. B.'s works have been published in three volumes.

BEECHER, THOMAS KENNICUT, b. Conn., 1824; son of Lyman; a graduate of Illinois college. He spent some time in teaching; became pastor of a Congregational church in Williamsburg (now the eastern part of Brooklyn), and afterwards of a similar church in Elmira, N. Y. He is the author of *Our Seven Churches*. He is a vigorous and spiritual preacher, a strong opposer of sectarianism, and a studious deviser of practical methods for bringing the influences of Christianity to bear through the church upon all classes in the community.

BEECHER (STOWE), HARRIET ELIZABETH. See STOWE, HARRIET ELIZABETH BEECHER, *ante*.

BEECHEY, FREDERICK WILLIAM, son of sir William B., the portrait-painter, was b. in London, Feb. 17, 1796. He entered the navy when he was 10 years of age, and at the age of 15 was present in an engagement off the coast of Madagascar, in which three French frigates were captured. In 1818, he took part under Franklin in a scientific voyage of discovery to the north pole, of which the results were published by order of the admiralty (1843). For the services he rendered with his pencil during this voyage, B. received a grant of £200 from parliament. In 1819, he was engaged in another arctic expedition under sir Edward Parry; and in 1821, rendered other important services to science by his exploration of part of the n. coast of Africa, of which the results were published in 1828. After being appointed commander, capt. B., in 1825, received a commission to proceed by the Pacific ocean and Behring's strait to the Polar sea, in order to communicate, if possible, with Franklin, who was to make the journey overland from North America. The explorers did not meet, although at one time they were within 150 m. of each other. He returned in 1828, having been two years and a half away, and in 1831 published a narrative of his voyage, which was afterwards followed by an account of the botany and zoology of the Arctic regions. Port Clarence and port Grantley, to the s.e. of cape prince of Wales, were discovered by B. in 1827. He was afterwards engaged in surveying the coast of Ireland and of South America; and was made rear-admiral of the blue in 1854. He died in 1856.

BEECHEY, Sir WILLIAM, R.A., an English portrait-painter of high reputation, was b. at Burford, Oxfordshire, Dec. 12, 1753. He entered the royal academy as a pupil in 1772, and devoted himself chiefly to portrait-painting, in which he was so successful, that in 1793 he was chosen portrait-painter to queen Charlotte, of whom he painted a full length. In the same year he was elected an associate of the royal academy; and in 1798, he received the honor of knighthood, and was made a royal academician for his picture of the review of the 3d and 10th dragoons in Hyde park by George III. (accompanied by the prince of Wales and duke of York), which is reckoned B.'s greatest work. Beechey now received the patronage of the royal family—most of the members of which sat to him—as well as that of the court nobility. Among his portraits are those of lord Nelson (preserved in the Clothiers' hall, London), sir William Hamilton, lord St. Vincent (in Fishmongers' hall), lord Cornwallis, John Kemble, and Mrs. Siddons. Beechey is not a portrait-painter of first rank, but his portraits are generally characterized by easy attitude and naturalness of expression. He retired from his profession in 1836, and died at Hampstead in Jan., 1839.

BEE'DER, the capital of a district of the same name in the Nizam's territories. It is about 75 m. to the n.w. of Hyderabad, being in lat. 17° 53′ n., and long. 77° 36′ e. It stands near the right bank of the Manjera, a considerable tributary of the Godavery, and occupies a table-land about 2400 ft. above the sea, and about 100 ft. above the adjacent country. Though B. was formerly a place of grandeur and importance, yet it is at present remarkable chiefly for its manufactures in a compound metal made up of 24 parts of tin to one of copper.

BEE-EATER, *Merops*, a genus of birds of the order *insessores* and tribe *fissirostres;* the type of a family, *meropidæ*, nearly allied to that of the kingfishers. The birds of the B. family have rather long slightly arched beaks, and long pointed wings: they are mostly of a green color; resemble swallows in flight; and, like them, prey on insects, but chiefly

on bees, wasps, and other hymenopterous insects. Their skin is very thick. The species of the genus *merops* are numerous in Africa and Asia; none are known in America; two are European, one of which, the common B. (*M. apiaster*), is common in the s. of Europe as a summer bird of passage. It is a very rare bird in Britain. It is mentioned by Aristotle, under the name *merops*, as very destructive to bees. It seizes them on the wing, and also often watches near their hives, and at the mouths of wasps' nests. It breeds in holes, which it excavates in the banks of rivers. "When the young are partly fledged, but not yet fit to fly, they creep to the mouth of their holes, where they seem to enjoy the happy summer light and genial sunshine; but on the least alarm, they trundle stern foremost into their inner chambers, where they lie concealed until tranquillity again prevails." In the banks of the Don and Volga, the excavations made by the flocks of bee eaters are so numerous, that the bank in many places resembles a honey-comb. Livingstone describes the banks of the Leeba, in South Africa, as perforated in a similar manner. The Hottentots watch the flight of the bee-eaters, that they may be guided to the nests of bees.

BEEF. See FOOD AND DRINK, DIET.

BEEF-EATER, a term now applied jocularly to certain functionaries belonging to the yeomen of the guard (q.v.), who, ever since the time of Henry VII., have formed part of the train of royalty, attending the sovereign at royal banquets and other state occasions. They have maintained the same costume, with a slight alteration made in 1858, for nearly four centuries; and this costume has had much to do with their attractiveness to sight-seers. The origin of the term is a case of what Dr. Latham calls "words of foreign simulating a vernacular origin." It was originally *beaufetier* or *buffetier* (Fr.), one who attends the *buffet* or sideboard. Similar instances of false etymology, arising from resemblance in sound, are seen in *Shot-over* (a hill near Oxford), from *Chateau Vert*; *sparrow-grass*, from *asparagus; ancient*, for *ensign; dog-cheap*, from the old English *god-kepe*, i.e., *good-cheap*, meaning *a good bargain;* etc.

BEEF-EATER, *Buphaga*, a genus of birds, of the order *insessores*, tribe *conirostres*, to which the name ox-pecker is also and more correctly given. The beef-eaters have short bills, square at the base, and rather swollen towards the point. They are accustomed to sit upon the backs of buffaloes, camels, and other large animals, and to feed upon the larvæ of gadflies, which they find in their hides. They are exclusively African. One of the species is the buffalo bird of South Africa. Livingstone mentions that the sight of the bird being much more acute than that of the buffalo, it is much more easily alarmed by the approach of danger; but the buffaloes always begin to look about them when the birds rise from their backs.

BEEF-TEA is a light and pleasant article of diet, obtained from the flesh of the ox. It is generally prepared by placing the meat (as lean as possible) in cold water, which is gradually heated, and then allowed to *simmer* for two hours or so; but the best method appears to be to commence by chopping the meat small, adding the cold water, and rapidly heating so as to bring it to boil. A little salt is then added to suit the taste. Either process, by commencing with cold water, succeeds in dissolving out of the meat the savory natural juices which it contains to the extent of about one eighth of its weight. Occasionally, hard-toasted bread, in fragments, is added to the tea just before being partaken of, which imparts to it some of the nutritious qualities of the bread. In using the beef-tea, the bread may or may not be eaten. The popular notion is, that the beef-tea contains all the nourishing constituents of the entire amount of meat employed in its preparation; but this is erroneous, as much nutritious matter is resident in the seven eighths of the original meat, left as residuary fleshy fiber, though the latter will, no doubt, prove of difficult digestion. The chemical constituents of beef-tea are *gelatin; albuminous matter; kreatine*, a substance resembling *theine*, the essential principle of tea and coffee; *extractive matters* (*osmazome*), to which the tea owes most of its odor and flavor, besides a part of its nutritious qualities; *lactic acid; salts;* a *little fat; saccharine matter*, and *water*. Beef-tea is highly palatable, and from its very easy digestion, it is recommended to invalids and convalescents. Mutton, treated in a similar manner, yields a broth or tea which is not so easily digested, and is hurtful to persons of weak stomach, especially if the fat be not skimmed off from the liquid. A knuckle of veal affords a similar broth or tea; but it is not so light as beef-tea, and, moreover, gelatinizes on cooling. A broth or tea prepared from a young chicken is, of all decoctions of animal matter, the most readily digested, and is specially suitable for invalids, where great irritability of the stomach exists.

BEEF-WOOD. See CASUARINA.

BEEHIVE-HOUSE, a name generally given to certain dome-shaped buildings in Ireland, which are believed to be among the oldest architecture remains in that country. They are round edifices, of no great size or height, built without cement, of long thin stones arranged in horizontal layers, the one slightly overlapping the other, and so gradually converging until they meet at the top. The doorway, which is square-headed, is somewhat narrower at the top than at the bottom, as in Egyptian architecture. Beehive-houses are of two kinds—single or clustered. The former are generally found beside ancient oratories, and are supposed to have been the dwelling-places of the priests;

the latter, which are often underground, show two or more hive-shaped chambers, connected by a passage or gallery, or opening from a larger central apartment, which is also hive-shaped. Irish antiquaries refer the beehive-houses generally to the period before the Anglo-Norman invasion of the island, in the 12th c., and claim for some of them an antiquity as high as the 7th and 8th centuries. Ruins of single beehive-houses are found in the western isles of Scotland; and some of the "Picts' houses," or "earth-houses," of the e. coast, seem to resemble the subterranean aggregated beehive-houses of Ireland.

BEELZEBUB (i.e., "the god of flies"). Under this name the people of Ekron, in Philistia, worshiped their god Baal (*q.v.*) or Bel. The Greeks also had their "Zeus Apomyios" or "Myiagros"—"the disperser of flies." As the heathen deities were all regarded as demons by the Jews, the name Beelzebub became, in course of time, commonly applied to the chief of evil spirits, and in this sense it is employed in the gospels. The more correct reading of the word, as given by the evangelists, is Beelzebul—an opprobrious change of name, making it signify "god of dung," to mark the low and groveling character of the demon. See BAAL.

BEEMSTER, the largest of the tracts of reclaimed or drained lands in the Netherlands, about 8000 acres, 12 m. n. of Amsterdam. There is a village of 2000 people in the district.

BEER, derived from the German *bier* (see ALE), is the term applied to a fermented liquid which has not undergone the process of distillation. It may be prepared from many varieties of vegetable matter, but in Britain the raw material operated upon is generally barley, although pease, beans, wheat, etc., might be employed. In other countries, B. is often prepared from other sources, to which allusion is made at the close of this article. The process followed in the manufacture of B. is divided into two parts —viz., *malting* and *brewing;* and so distinct are these, that very often the malting proceeds in a building at some distance from that in which the brewing is conducted, and in many cases the malting is superintended and accomplished by a *maltster*, as his particular and only branch of trade, the malt thus prepared being afterwards purchased by the brewer.

The variety of barley preferred for the preparation of the finer kinds of B. is the chevalier; but other varieties are extensively used. See BARLEY.

The process of malting, or the conversion of barley into malt, is accomplished in four successive steps. 1st. *Steeping* of the barley, which consists in introducing the grain into a large wooden or stone cistern, and adding thereto as much water as will cover it. On being thus treated for 24 hours, the grains of barley absorb the water, and the contents of the cistern, near the top, even begin to feel dry. The barley swells up much, so as to increase considerably in bulk, and the excise officers, if they choose, can gauge or measure the grain at this stage, and charge by the bulk thus indicated. The amount of water which barley takes up in the steeping, affords good evidence of the excellence of the grain for brewing. Thus, the better kinds of barley, on the average, take up sufficient water to increase their weight by one half. Occasionally, however, the increase is not more than a tenth. The time during which the grain lies in the steeping-cistern is about 40 hours, when the excess of water is drained off; but a regulation exists that the cistern cannot have a second charge of barley till four days have elapsed after the introduction of the first charge. 2d. *Couching.*—The grain is thrown out of the steeping cistern in a heap on the floor. At this stage the barley is soft, and when pressed between the fingers it is readily bruised. It lies in the couch or heap for 26 hours or so, and during that time it rises in temperature about 10° F., and gives out some of its extra water. This *sweating*, as it is called, is the result of the partial germination or growth of the barley; and little rootlets or fibrils of the radicle, and a primitive stem (plumula or acrospire) begins to form and present themselves. As the temperature rises, the radicles lengthen rapidly; and means are then taken to check the germination. 3d. *Flooring.*—The heated barley is spread by the workmen with spades on the floor to the depth of about 15 in. at first. It is repeatedly turned and respread over a larger area, with a thickness of layer decreasing to 6 inches. At this stage the radicles have attained their greatest length. 4th. *Kiln-drying.*—The half germinated barley is now introduced into a kiln, on the perforated floor of which it is spread. The apartment beneath the kiln-room is fitted up with stoves or choffers, which evolve much heat; and this, rising and passing through the slits or perforations in the floor of the kiln, necessarily dries any moist barley laid thereon, and the steam escapes at the roof. The heat which the barley is subjected to in the kiln is, at the commencement, 90° F., but this gradually is raised to about 150° F. While drying, the radicles—called *cornings* or *cummings*—break off from the grain, and are afterwards removed by a wire-sieve. The color which the barley assumes as it becomes dry malt in the kiln is determined by the heat to which it is subjected, the higher temperature yielding the dark-colored malt. *Pale* and *amber colored malt* are used in the brewing of the lighter varieties of B., such as bitter-beer, table-beer, and small-beer; whilst a darker kind of malt is used in sweet ale, and a very dark malt in the preparation of porter. During the conversion of barley into malt a loss of material occurs. Thus, 100 parts of barley yield 80 parts of malt; but as the 100 parts of barley contain 12 of water, it follows that there are present only 88 parts of dry matter, and these yield 80 parts of dry malt, giving a loss of 8 per cent of the original weight of the

barley. While there is a decrease in weight, there is an increase in bulk, 100 measures of barley becoming 101 to 109 measures of malt. Certain chemical changes likewise occur as the barley is transformed into malt, which may be noticed from the following table:

	Composition of Barley.	Malt.
Hordein (q. v.)	55	12
Starch	32	56
Sugar	5	15
Gluten	3	1
Gum	4	15
Resin	1	1
Total	100	100

The principal chemical change is, therefore, the transformation of much hordein (a form of starch) into starch, gum, and sugar. The mechanical condition of the contents of the grain is also altered; the grain is now of a fine mealy nature, and is readily broken between the fingers, when the flour in the interior is found to be soft and distinctly sweet to taste.

The *brewing* of the malt comprehends no less than six stages. 1st. *Grinding the malt*, which may be accomplished in several ways: either by placing the malt between two revolving horizontal circular stones, such as are employed in flour-grinding; or passing the malt through a mill like a large coffee-mill; or bruising it between revolving steel rollers. The last plan is the best, as it is desirable that the grinding should not be too perfect, which would give a fine flour, readily becoming pasty on the addition of water. When coarsely bruised, however, the water can find its way into all parts of the grain, and thoroughly soak it. 2d. *Mashing the bruised malt.*—This operation is conducted in a large tun, built up of wooden staves, and surrounded by hoops—somewhat similar in construction to an ordinary domestic churn. Water, which has been previously heated in a copper, is allowed to run into the comparatively cold mash-tun, while the bruised malt at the same time descends by the hopper, the water thereby becoming reduced to 160° F., or slightly below that temperature. The whole is then thoroughly agitated by long poles, worked by the hand or by machinery, till every particle of the malt is brought into contact with the water. The result is that the malt absorbs the water in part, and a very active change begins to take place. In the malt, there is developed a substance called *diastase* (q.v.), which reacts on the starch of the malted barley, and changes it into the variety of sugar called grape-sugar. See SUGAR. So rapidly does this transformation of starch into sugar occur, that almost immediately on the mixing of the water with the bruised malt, the liquid assumes a sweet taste. In the space of half an hour the temperature of the mash-tun will be found to have decreased to about 140° F.; and then a second quantity of water, at a heat of 190° F., is run in, so as to raise the temperature to about 167° F., which degree of heat is found to be the best for enabling the diastase to act most powerfully in transforming the starch into sugar. After two or three hours' action upon the malt, the water, which is now very sweet to the taste, is drawn off into a large vessel called the *underback*, and fresh water, at a temperature of about 190° F., is admitted to the tun, and allowed to soak the malt still remaining there. This part of the process is styled the *second mash;* and as the water is at a higher temperature than in the *first mash*, much of the residuary matter in the malt is changed into sugar, and dissolved. After some hours, the liquid from the second mash is drawn off, and added to that of the first mash already in the underback; and a third quantity of water, at a still higher temperature, about 200° F., is run in upon the malt, which dissolves out all the remaining portions of any value, and leaves the husk skin of the grain and other insoluble matters. The liquid from the *third mash* is not strong enough to be in general mixed with the other solutions in the underback, and is either employed in brewing small beer, or is again heated and used in treating new bruised malt.

In order that the brewer may be enabled to prepare the same variety of B. day after day, it is requisite that the liquid in the underback, and which is now called the *sweet-worts*, should be of a definite strength; and to determine this, an instrument called a saccharometer, a form of *areometer* (q.v.), is used, which enables the brewer to determine the strength of the sweet-worts, and, if necessary, to add some of the liquid from the third mash, to reduce the strength of that in the underback.

In the drawing off of the several worts from the mash-tun, advantage is taken of a finely perforated false bottom of plate-iron, which lies about a foot above the true bottom of the tun, and the liquids being drained away through the perforations in the false bottom, the insoluble husk and other matters are left behind. The material left on the false bottom, called *grains* or *draff*, is used for feeding cattle.

3d. *Boiling of the worts with hops.*—When reduced to the proper strength, the worts are pumped up from the underback into a covered-in boiler or copper, and being mixed with hops, are raised to the boiling-point, and kept in a state of ebullition for some time. During the boiling, it is necessary to keep the hops and other sediment from settling at the lower part of the boiler near the fire, and for that purpose a sort of rake with

teeth, turned by a wheel above, is kept turning round, which tends to hold the sediment in mechanical suspension. To economize heat, it is customary to have a tank fitted to the upper part of the boiler in which water or the worts can be heated. The hops which are obtained from Kent and Sussex are the strongest, and are employed in the brewing of porter, while the Worcester hop is milder, and is preferred for ale. The hops are useful in the brewing of B. in imparting to the liquor a volatile fragrant aromatic oil, a bitter resin, and a little tannin. The quantity of hops required to be added depends much on the kind of B. which it is intended to brew. The stronger the B. is to be, and above all, the more bitterness is required, the more hops must be added to the boiler. In common ale or B., the quantity of hops does not exceed 2 lbs. to the quarter of malt; whilst in bitter-beer, and especially that intended for foreign countries, the amount of hops is 8 lbs. and upwards. Besides imparting to the worts the active constituents of the hop, the boiling operation serves other important ends. In the sweet-worts, there is a considerable quantity of nitrogenous matter, which is very liable to pass into decomposition, and which, were it to do so, would destroy the beer. During the boiling, the excess of this nitrogenous matter separates as a flaky and stringy solid, called by the brewer *mucilage*. The boiling is continued till the hops have yielded their aromatic and bitter principles, and till the liquid has been concentrated to the extent required by the brewer, and then the whole is run into the *hop-back*, a form of cistern which has a false bottom composed of perforated iron plates, admitting of the liquid worts percolating through, while all the mucilage and other solid matters are retained on the upper surface of this metallic sieve. 4th. *Cooling the worts.*—As the liquor drains through the false bottom of the hop-back, it is run on to the *cooler* or *refrigerator*, which, in size and appearance, resembles the ordinary wooden floor of a large room. The planks are so closely connected together that the liquid cannot run through, and a wooden ledge runs round the sides of the room, which is also tight. The hot worts, which are spread to the depth of a few inches over the floor, are very rapidly cooled down, by allowing a free current of cold air to pass over the top of the liquid, and often by having a series of fans revolving rapidly immediately above the liquid, so as to cause a more speedy removal of the heated air loaded with steam, and the substitution of cold air. Occasionally, the brewer is at the expense of having a coil of metal pipe, placed up and down the floor of the cooler, through which metal pipe cold water is allowed to run at the time the hot worts are being cooled down. By these means the worts are very soon reduced to a temperature of about 60° F. This step in the process of brewing is a very important one, as, if the cooling is not conducted with the greatest rapidity, the sugar in the worts will become partially converted into acetic acid, or, as it is termed, *foxing* occurs, which communicates bad properties to the worts, and ultimately produces a beer with an unpleasant taste and flavor. 5th. *Fermenting the worts.*—When the liquid has been cooled down to 55° to 60° F., it is conveyed to the fermenting tun, where it is mixed with the yeast (q.v.), and the process of fermentation proceeds. The tun or vat is formed of strong wooden staves, and is either circular or square. The latter form has recently been introduced, and appears to be preferred by some brewers. The yeast is added in varying quantity, according to the strength of the worts, but the more common amount is one gallon to every 100 gallons of the worts. Very soon after the yeast is mixed with the worts, the whole contents of the tun begin to pass into a state of commotion, much gas is evolved, and this, tending to escape, causes a *frothing* on the surface of the liquid termed the *rocks*, from the irregular mountainous appearance of the masses of froth piled on each other. The color of the froth at this period indicates the quality of the beer. Thus, if the froth appears of a yellowish-white or yellow tint, the operation is going on satisfactorily; but if the color darkens to a brownish yellow or a light brown, it is considered a bad sign, and the beer is spoiled as a first-class beverage. The chemical changes which occur during the process of fermentation (q.v) are due to the action of the particles of yeast on the sugar or saccharine matter. This action proceeds most satisfactorily at a temperature of 72° F., and care is taken in the brewing of the finer varieties of B., such as India pale ale and bitter-beer, that the temperature never exceeds 72° F. The grape sugar which is present in the worts as they are introduced into the fermenting tun, is composed of carbon, hydrogen, and oxygen in the proportion C_{12}, H_{14}, O_{14}; and when the yeast acts upon it, a greater or less proportion of it is converted into alcohol, carbonic acid, and water. Thus, one atom of sugar, $C_{12}H_{14}O_{14}$, is converted into 2 atoms of alcohol ($C_4H_6O_2$) = $C_8H_{12}O_4$; 4 atoms of carbonic acid (CO_2) = C_4O_8; and 2 atoms of water (HO) = H_2O_2; which, when added together, give the atom of sugar, $C_{12}H_{14}O_{14}$. The carbonic acid tending to escape, causes the frothing or rocks, and the alcohol and water are left in the fermenting tun. During the progress of the fermentation, a considerable amount of new yeast is formed, which gets entangled in the froth; and when the operation slackens, and the frothy head begins to fall, the upper yeast is skimmed off. This process of the conversion of the sugar of the worts into alcohol or spirit, is termed attenuation (Lat. *tenuis*, thin); and the degree to which the change is carried depends on the kind of B., and the market it is to be sent to. In sweet ale or B., the attenuation is not allowed to proceed far, and much sugar is left in the beer. Bitter-beer, however, is attenuated to a greater degree, and consequently there is less saccharine matter left in it; while in India pale ale, and other beers intended to be sent great distances, the attenuation must be carried on much further,

else the liquor would not be preserved during its transit to many parts of the globe. 6th. *Clearing* and *storing*.—The B., when properly fermented, is placed in casks like hogsheads, called *rounds*, where the remaining traces of fermentation proceed, and the B. ceases to appear thick or drumly, and becomes clear; when it is pumped up into store-casks of great size, or at once placed in the casks in which it is sent into market. During the storing of the B., an extra quantity of hops is often added, to increase the bitterness and pungency.

The principal constituents of the various kinds of B. are water, alcohol, sugar, gum, gluten, and the bitter extractive matter of the hop. The amount of alcohol varies: in small-beer, it is only about 1 per cent; in ale, the stronger kinds of B. and porter for home consumption, 5 to 7 per cent; in East India pale ale, 10 per cent. In B. intended to be forwarded to California from Britain, the attenuation is carried so far, that there is more than 10 per cent of alcohol, and the B. is then called *dry*.

B. is adulterated in many ways. Burned sugar (caramel) is added to give color; cocculus indicus, to supply an intoxicating agent which will give an appearance of strength to the B.; quassia, to impart bitterness in place of hops; grains of paradise and Cayenne pepper, to communicate pungency; coriander and caraway seeds, to yield flavor; liquorice, treacle, and honey, to supply color and consistence. To stale beer there is sometimes added green vitriol (sulphate of iron), or alum and common salt, which, when agitated with the B., communicate a fine cauliflower head. It is unnecessary to state that such admixtures are never made in any extensive brewing establishment with respectable connections.

For the home-brewing of B., many recipes have been published, and one of the best is that given by Mr. Donovan in the *Cabinet Cyclopedia*. The apparatus he suggests is of the roughest description, and comparatively inexpensive. A porter-barrel forms the mash-tun; the upper end being taken out, perforated with a gimlet, and lowered into the barrel to near the bottom, where it is supported about a couple of inches from the true bottom, and constitutes the false bottom through which the liquid drains from the bruised malt. A hole is made in the side of the barrel, near the bottom, and between the true and false bottoms, which can be plugged up with a spigot when not required to let the liquor run off. A second porter-barrel will be useful as an underback and fermenting tun. An ordinary household boiler, or a large common tin-plate one, will answer the purpose of boiling the worts. The mash-tun is first well scalded with hot water, and then is supplied with 15 galls. of boiling water and 5 galls. of cold water at 60° F., 2½ bush. of first-class bruised pale malt are shaken in, and well stirred through the water, the top of the barrel being in greater part closed with a thick cloth. In an hour or so, the liquid which is in the tun will be clear when allowed to run out at the spigot-hole; and immediately after it ceases to run, about 20 galls. of nearly boiling water are run over the half-exhausted malt, and this carries off all the soluble matters, yielding altogether about 23 galls. of sweet-worts. These are placed in the copper, 3½ lbs. of the best mild hops are added, and boiled for 20 minutes. The liquor is then strained through a fine sieve into the fermenting tun; and when it has cooled down to below a blood-heat (98° F.), a quart of yeast is added, and the fermentation allowed to proceed. When the frothy head begins to droop, the upper yeast is skimmed off, the liquor put in a cask, bunged up, and allowed to clear for a fortnight, when it will be ready for use.

The foregoing remarks on the manufacture of B. apply to all the varieties of B., ale, and porter (q.v.), brewed and used in Britain. The liquor may differ in strength, from difference in the quantity of water, or in color, from the malt being more or less charred in the kiln-drying. There are, however, many other varieties of beer. In South America, the Indians prepared and drank a B. obtained from Indian corn, and called *chica* or maize B., long before the Spanish conquest. The process followed in making chica is similar to that of beer-brewing in Britain. The maize is moistened with water, allowed partially to germinate, and dried in the sun. The maize malt so prepared is bruised, treated with warm water, and set aside till the fermentation is over. The chica or maize B. has a yellow color, and a pleasant acid taste. In the valleys of the Sierra, the maize malt is chewed between the teeth of the Indians and their households, and the chewed morsel incorporated with the saliva is put in jars with hot water, when the fermentation proceeds more rapidly than before, and a more highly-prized B. is obtained. The chica is also made from barley, rice, pease, manioc, pineapples, and grapes. The Crim Tartars prepare a B. from millet-seed, called *bouza* or millet-beer. The same seed is used in Sikkim, on the southern slopes of the lower Himalaya, and yields B. there called *murwa*. The Arabians, Abyssinians, and many African tribes employ *teff*, or the seeds of *poa Abyssinica*, and millet-seed, as sources of beer. The Russians prepare a B. from rye called *quass* or *rye-beer*. The Tartars ferment milk into *koumiss* or milk-beer. The Arabians use the milk to yield their *leban*, and the Turks to produce their *yaourt*. In the n. of Scotland, the Orkneys, and some parts of Ireland, buttermilk, or *sour-milk*, is allowed to stand till fermentation begins, and an intoxicating liquor results. The South-sea islanders prepare a B. from the root of *Macropiper methysticum*, or *the intoxicating long pepper*, which is called ava (q.v.).

The successful brewing of B. depends much on the kind of water employed. The water which is found most suitable contains much common salt, sulphate of lime, and

carbonate of lime, in a state of solution. The waters employed in the most extensive breweries contain at least 60 grains of earthy salts dissolved in each imperial gallon. Great care must be taken to select water which not only has the proper amount of saline ingredients, but at the same time is free from organic matter either of animal or vegetable origin. Water containing such is liable to the decomposition and putrefaction of its constituents, and by contamination, causes the B. prepared by means of it to be more liable to go wrong in the brewing, and to possess ultimately an unpleasant taste.

The employment of B., especially of that variety known as bitter-beer, has recently rapidly advanced in public estimation as a beverage and article of diet. Bitter-beer acts as a tonic and slight stimulant, and in many cases it is recommended by medical men to convalescents in place of wine. Some statistics regarding the consumption of the different kinds of B., and other kindred beverages, will be found under FERMENTED AND DISTILLED LIQUORS.

BEER, J. MEYER. See MEYERBEER.

BEER ACTS, the 11 Geo. IV. and 1 William IV. c. 64, the 4 and 5 William IV. c. 85, and the 3 and 4 Vict. c. 61, amended by the wine and beer-house acts, 32 and 33 Vict. c. 27, 33 and 34 Vict. c. 29, and the intoxicating liquor acts, 35 and 36 Vict. c. 94, 37 and 38 Vict. c. 49. By the earlier of these acts (all relating to England), every householder assessed to the poor-rates, in any parish or place (and not being a sheriff's officer, or officer employed to execute judicial process), could, without any license from the magistrates, apply for and obtain an excise license, to enable him to sell beer and cider, by retail, at some house situated within such parish or place, and specified in such license. But in order to obtain such license the applicant must produce an overseer's certificate that he was the real resident, holder, and occupier of such house, and rated to the poor-rate in a certain amount; and must enter into a bond with one sufficient surety, in the penal sum of £20, or two sufficient sureties in the penal sum of £10 each, for the payment of such penalties as he may incur under the acts; and if he is also desirous for permission that the liquor should be drunk *on the premises*, he must, moreover, annually deposit with the commissioners of excise (now the board of inland revenue), or other person authorized to grant the license, a certificate "of good character," signed by six rated inhabitants of the parish, of whom none shall be maltsters, common brewers, or licensed publicans, or owners of licensed public-houses. These requirements were easily evaded as regards the evidence of good character, and in 1869 the new practice was introduced by the wine and beer-house act, 32 and 33 Vict. c. 27, of not only requiring the house to be of a certain valuation, but the applicant to go first to the justices of his division or borough for a certificate, which thus enabled some inquiry to be made into the respectability of the persons keeping beer-houses. This certificate of justices, sometimes also called a justices' license, is indispensable before getting an excise license. It is, moreover, required that every person obtaining a license, shall paint conspicuously over the door of his premises, in such form and manner as the acts specify, his Christian name and surname at full length, and the words "licensed to sell beer (or cider) by retail," with the addition of "to be drunk on the premises," or "not to be drunk on the premises," as the case may be. Penalties are also imposed on every retailer of beer or cider who shall transgress, or allow to be transgressed, any of the numerous and stringent provisions of the licensing acts 1872–74. The license to sell beer is confined to that particular privilege; and persons, under cover of it, attempting to sell wines or spirits, are not only liable in a heavy penalty, but may be deprived of their beer license. On the other hand, a license to sell wines and spirits is quite distinct; but all excise licenses to retail liquors must be preceded by a justice's certificate.

The wine and beer-house acts of 1869 and 1870 still mainly govern the qualifications of those who sell beer by retail, and a similar law is applied to those who sell wine and liquors by retail in refreshment houses. The law was, however, deemed imperfect as regards the offenses which the keepers of licensed houses are prone to commit, and it required the intoxicating liquors licensing act of 1872, c. 94, and of 1874, c. 49, to create more uniformity as well as stringency in the requirements. During Sundays, all licensed houses require to be shut except between 12½ or 1 P.M. and 2½ or 3 P.M., and between 6 P.M. and 10 or 11 P.M., the justices having a slight power to vary these hours. A fixed time of opening and closing is also prescribed for week-days. When a keeper of the house is convicted of an offense, it is usually indorsed on his license, and after three indorsements he forfeits the license; and, in some cases, even the landlord's power to relet the house for the sale of liquors is suspended for some years, according to the nature of the offenses. Though the houses are closed for part of Sundays, yet travelers and lodgers are exempted in most cases, and can be supplied as usual with liquors. Some of the penalties have been admitted to be too severe, and require modification.

The place where beer is exclusively sold is called a *beer-house*, differing in this respect from an *ale-house*, which means a place where other liquors as well as beer are retailed. The term *public-house* applies to the second most frequently.

The sale of beers or ales in Scotland is regulated by the act 25 and 26 Vict. c. 35, amending the act 9 Geo. IV. c. 58, and the 16 and 17 Vict. c. 67, commonly called the "Forbes Mackenzie act." Justices and magistrates meet twice a year to grant certificates. By the form of license thereby prescribed, no liquors of any kind can be sold on

Sunday in any inn, hotel, shop, or any public-house, except to lodgers and travelers. In the English acts the words "*bonâ-fide* travelers" are used, which mean the same thing, and they are held to include persons traveling two or three miles for business or pleasure. Many of the penalties of the act 25 and 26 Vict. c. 35, exceeded those of the English acts, but the English act of 1872 far outstripped in stringency (except as regards Sunday) the Scotch acts.*

BEERBHOOM', or BIRBHOOM', a district in the lower provinces of Bengal, with an area of 1344 sq.m., and a pop. (1871) of 695,921. It extends between n. lat. 23° 32′ and 42° 40′, and between e. long. 86° 25′ and 88° 30′. The chief town is Suri, 100 m. n.n.w. of Calcutta, and after it the district is sometimes named. The inhabitants are generally a rude race, and there appear to be hardly any places worthy of the name of towns.

BEER-MONEY was a peculiar payment to non-commissioned officers and soldiers in the English army. It was established in the year 1800, at the suggestion of the duke of York, and consisted of one penny per day for troops when on home-service, as a substitute for an issue of beer and spirits. It continued as an addition to the daily pay until 1873, when, the stoppages for rations having been abolished, the opportunity was taken to consolidate beer-money and pay proper.

BEER SHEBA, or BIR-ES-SEBA ("well of the oath," or "well of the seven"), so called because here Abraham entered into an alliance with Abimelech, king of Gerar, which he ratified with an oath and a gift of seven ewe lambs. B. was situated on the southern border of Palestine, about 52 m. s.w. from Jerusalem, and formed the limit in that direction of the Israelitish dominion. It was one of the most ancient as well as one of the most interesting places in sacred record. While Abraham resided at this place, he received the command to sacrifice Isaac, whose residence it also was. Esau was robbed of his birthright and blessing here, and here Jacob sacrificed to God before departing into Egypt; the sons of Samuel were made judges here, and it was from hence that Elijah was forced to flee into the desert from Jezebel's wrath. After the captivity, B. was occupied for some time by the Jews, and in the 4th c. A.D., it was a Roman garrison. Afterwards, the crusaders are said to have fortified it, and to have regarded it as a place of importance. Two circular wells of fine pure water—the largest being 44 ft. deep to the surface of the water, and 12½ ft. in diameter—and a heap of ruins about half a mile long and a quarter broad, remain to mark the place where B. once was.

BEE'SHA, a genus of grasses with the habit and most of the characters of bamboos, but remarkable for the fleshy pericarp which incloses the seed, forming a sort of berry. The species are few, natives of the East Indies.

BEES-WAX is principally obtained from the ordinary bee-hive, where it is elaborated by the workers. See BEE. For some time, it was matter of dispute whether the bees really manufactured the wax from other ingredients in their food, or if they performed the simple task of carrying the wax ready made from the plant to the hive. It appears now to be definitely settled, that while, in ordinary circumstances, bees may derive part of the wax from plants, yet, when they are fed entirely upon pure sugar, they continue to elaborate wax, and to build up the walls and partitions of the honey-comb. The wax procured from British hives is considered the purest and best, but the smallness of the amount necessitates the importation of comparatively large quantities from North America, Brazil, Singapore, Ceylon, Gambia, and Mogadore. British bees-wax is naturally of a yellow color, whilst that procured from foreign countries is darker in tint; and in the case of the wax from Brazil, which is yielded by a species of black bee living under-ground, the color is a dark mahogany, and the material is soft and tenacious. In the separation of the honey from the wax, the honey-comb is subjected to pressure, which squeezes out most of the honey; the residual comb is then treated with water, and heated, with constant stirring, till the wax melts, when the whole is passed through hair-bags. The wax is received in a vessel of cold water, where it is at the same time washed, and cooled down till it solidifies, as a thick cake, on the surface of the water. For many purposes, it is necessary to bleach the wax, and the common method is to obtain it in thin sheets or ribbons, by melting it under water, and pouring it upon horizontal wooden cylinders, which are kept revolving half immersed in water in a perforated vessel. The sheets or ribbons of wax so obtained are laid out upon a field with a southern aspect, and being repeatedly watered, are subjected to the joint action of the sun's rays, the ozone of the air, and moisture. In a short time, the wax loses its yellow tint, and becomes white. Attempts have been made to perform the bleaching more expeditiously by employing chlorine, bleaching-powder, and other chemical agents. The only process which appears not to injure the wax is to melt it, and for every pound add 2 ozs. of pulverized nitrate of soda, and 1 oz. oil of vitriol, diluted previously with 8 ozs. of water. While the latter is gradually poured in, heat is applied, and the whole mixture swells up, necessitating the employment of a capacious vessel. On cooling, the

*A shebeen is the name given in Scotland to a house or place where liquors are sold without a justice's or excise certificate. Every person found in such a place, drunk or drinking, may be taken before a justice, or detained in a police-station till this can be done, and he may then be fined ten shillings, or, in default, imprisoned ten days.

wax gathers on the surface, and being repeatedly treated with hot water, to wash away impurities, is finally allowed to solidify in a cake.

Purified B. has a density of 960 to 966, and is therefore lighter than water, which is taken as 1000. In thin slices, it is translucent, and is tasteless, odorless, and colorless. At 32° F., it is hard, brittle, and solid. When heated to 85° or 90° F., it softens, and can then be kneaded between the fingers like moist dough or putty, and at 145° F. it fuses, and becomes a true liquid. It is insoluble in water, and is partly soluble in boiling alcohol, and partly not. The alcoholic solution, which takes up about 80 to 90 per cent of the wax, contains principally a substance called *cerine*, which separates in crystals as the solution cools, and *cerolein*e, which remains dissolved in the cold alcohol. The matter which resists the solvent action of the alcohol is a substance called *myricine*. B. is largely used in the manufacture of wax-candles and tapers; and though it has recently been very much excluded from the manufacture of ordinary candles, from the readiness with which first-class composite candles can be made indirectly from tallow, yet it is often used as one of the ingredients in composite candles to impart hardness to the manufactured article. The very large candles used in Roman Catholic countries for church-services, are always made of wax alone.

BEET, *Beta*, a genus of plants of the natural order *chenopodiaceæ* (q.v.), distinguished by a 5-cleft perianth, 5 stamens inserted on a fleshy ring surrounding the ovary, and the fruit adhering to the calyx, and collected in clusters of two or three. The species are not numerous; they are mostly biennials, with smooth, ovate, stalked root-leaves, and tall, leafy, flowering-stems. They are natives of the temperate parts of the old world. The COMMON B. (*B. vulgaris*) is a native of the shores of the Mediterranean, but is now in very general cultivation both in fields and gardens, chiefly for the sake of its large succulent and generally carrot-shaped roots, which are used as food both for man and for cattle, and from which also sugar is largely extracted on the continent of Europe. Beet-roots may be substituted for malt, when deprived of the greater part of their juice by pressure. The variety chiefly cultivated in gardens is known as RED B., from the color of the root, which also more or less appears in the leaves and leaf-stalks. The subvarieties are very numerous. In some, the root is rather turnip-shaped than carrot-shaped, and the size and color also vary much, some being of a deep blood-red, or even almost blackish color, both externally and internally; and others of a much lighter red, and internally even white. It forms a favorite pickle, and is also very agreeable as a boiled vegetable when properly dressed. The seed is sown so late in spring, that the plants may not produce flowering stems the first year, which, when it occurs, renders the root fibrous and useless.—MANGOLD-WURZEL (q.v.), so valuable as a field-crop for food of cattle, is, in general, regarded as merely a larger and coarser variety of the common B., in which the red color is comparatively little exhibited, although some botanists have, on very slender grounds, endeavored to erect it into a distinct species.—The WHITE B. of our gardens (*B. cicla* of some botanists) is now also generally supposed to be a mere variety of the common B., with little or no red in its roots or leaves, and a comparatively slender root. It is cultivated for the sake of its leaves, which are used in the same manner as spinach, and form an excellent substitute for it, especially in the beginning of spring. The leaf-stalks and midribs (*chards*) of the leaves, especially of a variety in which these parts are unusually developed, are also dressed for the table.—SEA-B. (*B. maritima*) grows wild upon the shores of Britain, and differs from the common B. in its perennial root, its partly prostrate stems, and other characters. The leaves are used for food in Ireland, as are those of *B. Bengalensis* in the East Indies.

BEET-FLY, *Anthomyia Betæ*, an insect which infests crops of mangold-wurzel, and other kinds of beet, depositing its eggs on the leaves, the soft parts of which the larvæ devour, causing them to assume a blistered appearance, and when numerous, injuring the health of the plants. It is a two-winged insect (see DIPTERA), of the great family *muscides*, of which the common house-fly may be regarded as the type, and belongs to a genus of which more than 100 British species are known, the larvæ of some of which are well known as feeding upon the roots of cabbages, turnips, etc. See CABBAGE-FLY, TURNIP-FLY, and POTATO-FLY. It is not so large as the common house-fly.

BEETHOVEN, LUDWIG VAN, the unrivaled composer, whose works have made a new epoch in the development of music, was born at Bonn, Dec. 17, 1770, and died in Vienna, Mar. 26, 1827. His father, a tenor-singer in the elector's chapel at Bonn, began to cultivate the genius of his son when only five years of age. He next placed him under the court-organist, Van Eden, and shortly after under the composer Neefe. In his eighth year he created astonishment by his performance on the violin; when only 11, he played the music in Bach's *Wohltemperirtes Klavier ;* and in his 13th year he published, at Manheim, a volume of variations on a march, songs, and sonatas. In 1792 he was sent to Vienna by his patron, the elector of Cologne, to enjoy the instructions of Hadyn, who first made him acquainted with the works of Händel. He also studied composition under Albrechtsberger. There he soon attracted notice by his extraordinary ability as an extempore player of fantasias, and also by some compositions, which, however, did not escape the censure of critics. He became so much attached to Vienna, that, after his patron's death in 1801, he determined to remain, and declined an invitation to

England. In 1809, when another offer tempted him to leave Vienna, several friends of music, with the archduke Rudolf at their head, raised a subscription to provide for the composer a pension sufficient to retain him. At Vienna, therefore, he stayed during the remainder of his life, secluded from the world, of which he knew as little as it knew of him; and in later years, still more isolated from society by a defect of hearing, which gradually became confirmed into entire deafness. In this sad inviolable solitude, he produced his new symphonies, his sublime overtures, his quintets and quartets, so full of profound conceptions and mysterious revelations of the highest harmonies, and his pianoforte sonatas, which express, sometimes, a peculiar train of feelings, at other times appear to represent his own recluse character. Shut out in a large measure from the ordinary pleasures of life, ignorant of the sweetness of married life, and able to enjoy only in a slender measure social intercourse, he retired for compensation into the world of his own imagination, and brought forth from its deep resources those treasures of harmony which, though at first received with a shy astonishment rather than a cordial admiration, are now ranked among the works of art which cannot die. These new forms and original creations, which display B.'s majestic powers in music, were only gradually developed; in his early productions, he submitted to established forms of composition.

The works of B. may be divided into three classes, or may be assigned to three distinct periods of his intellectual development. All the works of his first period, though important, show the influence of his teacher Hadyn, or of his more highly esteemed model, Mozart. This period of composition may be said to extend to his 16th orchestral work, including, besides several pianoforte sonatas, trios for pianoforte and for stringed instruments. All these early works display the highest cultivation of the forms and principles of art previously established in the Viennese school of music.—The second period of B.'s artistic life, in which his genius was completely self-reliant, extends from the 16th to the 80th work. This was certainly the most productive and brilliant part of his career. To it belong his greatest creations, his magnificent and powerful orchestral works—symphonies, overtures, etc.—all of which display the highest qualities of imaginative composition. Besides the great orchestral works, it includes many sonatas for pianoforte, and various compositions of chamber-music—septets, quintets, quartets, trios, serenades, etc. In dramatic composition, B. produced only one opera, but this was *Fidelio*, the first truly German musical work of a dramatic character. This was the result of great study, and, as it is now given, is the reconstruction of an earlier composition. Other dramatic pieces are—the overture, interludes, and melodramatic music in Goethe's *Egmont*, and the instrumental music and choruses in the *Ruins of Athens*.—In the third and last period of B.'s career we find those two gigantic works, the *Missa Solemnis in D Minor*, and the ninth symphony (D minor) with chorus. These works transcend all common laws and forms, and belong to the highest sphere of art. Their deep mysteries can be apprehended only by those who have deep emotions and profound technical knowledge of music. Other works of this last class approach those just mentioned, though they do not reach the same elevation. But all are alike in passing far beyond the ordinary traditional forms of art. All are pervaded by an impulse as of inspiration. Among these works may be mentioned, the great quartets for bow-instruments (mostly published after the death of B.), the grand overtures—works 115 and 124—and several sonatas for pianoforte, especially that in B♭ major.

The life of B. has been written by Schlosser, Schindler, Moscheles, Marx, Nohl, Thayer (1866–71). See also Nettobohm, *Skizzenbuch B.'s.*

BEETLE, a name popularly applied to many kinds of coleopterous insects. It is never extended to insects of any other order, and it is sometimes used in works on natural history as a common name for all coleopterous insects; but this makes it to include many kinds to which it is not popularly applied, as fire-flies, lady-birds, weevils, cantharides, etc. It is also employed by some authors, in a more restricted sense, as a designation of the insects forming the large tribe *scarabæides;* but the restriction, equally with the extension, is an interference with the popular use of the English word, of which, however, the limits are very uncertain. To frame an article, with strict regard to that popular use, and at the same time to science, would not be easy, nor would it be profitable, as the assemblage of kinds would be not only large, but very miscellaneous. We think it better to refer to the article COLEOPTERA, and to the articles SCARABÆIDÆ, BOMBARDIER BEETLE, STAG BEETLE, BURYING BEETLE, GOLIATH BEETLE, ROSE BEETLE, etc. The name BLACK BEETLE is often given to the Cockroach (q.v.). See also BLAPS.

BEETLE-STONES, the name given by the lapidaries of Edinburgh to hard nodules of clay ironstone, found abundantly in a low cliff, composed of shale, at Newhaven, or strewed upon the beach in that neighborhood. They take a beautiful polish, and have been employed to make letter-weights and other ornamental articles. The name was given in consequence of the supposed origin of the fossil which is of most frequent occurrence as the nucleus of the nodules, which, however, is not a fossil beetle, but a cropolite (q.v.). Some of the nodules contain a fossil fish, and some a fossil of vegetable origin.

BEETLING is a finishing mechanical process applied originally to linen shirting, and afterwards to cotton shirting, in imitation of linen, to give the cloth a hard and wiry

look, by flattening the yarn irregularly in an angled manner. This is done by the rising and falling of upright wooden stampers, placed close together in a row, with their square butts resting on a roller over which the cloth passes under them, doubled in a particular way so as to give the yarn an angled appearance when struck. The stampers are worked by the rotation of a horizontal shaft, acting with tapets, like the cylinder of a barrel-organ.

Linen weft is likewise beetled, but by hand-hammering, on a large flat stone, with a wooden mallet, to soften the yarn for easiness of working it, or "getting it on," in the language of the craft, in weaving. Beetling is likewise a process in flax-dressing, to separate the woody from the flexible fibers of the plant. See FLAX-DRESSING.

BEET-ROOT SUGAR. See SUGAR. The sugar obtained from the beet is similar to cane-sugar, but inferior in sweetening power. Beet-root contains on an average about 10 per cent of saccharine matter (sugar-cane, 18 per cent); of the varieties, the white Slesvig beet is the richest. To obtain the sugar, the roots, after being washed, are first rasped down by machines, so as to tear up the cells. The pulp is then put into bags, and the juice is squeezed out by presses. The juice is next treated with lime or sulphuric acid, to clarify it, and also filtered till no deposit is formed; after which it is boiled in large boilers to concentrate it. When it has attained a certain density (25° Beaumé), it is poured through flannel, and is now a dark-colored syrup, which, in order to yield pure sugar, must be deprived of its coloring-matter and mucilage. This is effected by filtering it through animal charcoal or bone-black. The filtered juice is now treated with lime-water beat up with a little white of egg to a lather, till it is slightly alkaline, and is then further concentrated by boiling in copper pans, care being taken to stir and scum it all the while. When sufficiently concentrated, it is put into vessels, and allowed to stand several days in a warm room to crystallize; the uncrystallized part, or molasses, is then drained off, and what remains is raw sugar. This is still further refined by again dissolving and treating it with albumen and blood. In separating the crystallized from the uncrystallized part, centrifugal machines are now much used. Another improvement is the vacuum-pan, which allows the juice to be boiled down without burning. The molasses drained off from beet-root sugar has a disagreeable taste, and cannot be used for sweetening, like cane molasses.

About the middle of the 18th c., Marggraf, an apothecary in Berlin, drew attention to the sugar contained in beet-root; but Achard, the Prussian chemist, was the first who was tolerably successful in extracting it. Still, as only 2 or 3 per cent of sugar was obtained, the product did not pay the cost, until Napoleon's continental system raised the price of sugar, and gave rise to improved methods of manufacturing it. Even after the fall of Napoleon, protective duties kept alive this manufacture in France; and when numerous improvements of method had raised the percentage of sugar realized to about 5 lbs. from 100 lbs. of beet, it took a fresh start (about 1825) in France and Belgium, was revived in Germany, and spread even to Russia. The falling off of the customs duties on the import of colonial sugar obliged the German governments to impose a small duty on beet sugar, which checked the manufacture for a time; but owing to the protective measures of the Zollverein, the trade soon recovered, and is still brisk. Large quantities are annually imported from the continent of Europe, and are used by our refiners mixed with cane sugar, without which it is not successful, for producing the best qualities of refined or loaf-sugar. The imports into Great Britain from the continent, in 1875, amounted to about 240,000 tons.

BEET-ROOT SUGAR. The production of beet-sugar is an industry entirely of modern growth, taking root first in France during the reign of Napoleon I., and subsequently establishing itself after many difficulties in Belgium, Germany, Austria, Russia, and Holland. The table shows the produce of beet-sugar in these countries in 1876.

France	420,000 tons.
Germany	320,000 "
Austria and Hungary	50,000 "
Russia	250,000 "
Belgium	80,000 "
Holland	30,000 "

The development of this industry in Russia has been very rapid since 1864; but, on the other hand, it has been for some years on the decline in Austria, the produce (chiefly Bohemian) of that country having been as high as 180,000 tons of sugar in 1870. All other countries are as yet of minor importance as beet-growers; but in Sweden, Denmark, England at Lavenham, and California, beet-sugar factories have been established with promising results. Several attempts have been made within the last thirty years to make beet-sugar a profitable manufacture in Ireland, but none have as yet been quite successful. The following figures show how rapidly the beet-sugar manufacture has on the whole prospered. Total produce of all countries:

1853	200,000 tons of sugar.
1863	452,000 "
1867	650,000 "
1876	1,154,200 "

This large annual yield of 1⅛ million tons has been maintained for some years, and forms about one fourth on the sugar now produced from all sources.

An acre of land planted with beet can be made without difficulty to yield at least a ton of sugar, worth from £20 to £24, and there are certain by-products besides. The average percentage composition of the root of the sugar-beet is as follows: Sugar, 10½; fiber, etc., 5; gluten, soluble organic compounds, and ash, 3; water, 81½; But the proportion of sugar varies much—it being greater in small than in large beets, in dry than in moist climates, in light than in heavy soils, in the part of the root under than in that above ground, and when manure has not been directly applied to the crop.

Crystallized sugar, although by far the most valuable, is not the only useful product of beet-root, as the following list of its products will show: (1) Crystallized sugar; (2) exhausted pulp useful for cattle food; (3) coarse spirit obtained by fermenting the uncrystallizable sugar; (4) potash salts. The fibrous portion of the root is sometimes used to mix with other material for making paper.

The distillation of spirits from beet is largely practiced on the continent, and many good judges maintain that it is really a more profitable business than the manufacture of beet-root sugar. In Belgium and Germany the two industries are frequently combined, an arrangement which possesses the advantage that, in a season when the proportion of sugar in the roots is too small to yield more than a bare profit, the manufacturer may ferment the sugar-containing juice. The spirit thus obtained yields a fair return even when the beets contain only from 5 to 6 per cent of sugar. This manufacture has been tried in England with but little success as yet; but there really seems no good reason why both sugar and spirits should not be profitably made from beet either in England, Scotland, or Ireland.

BEFFA'NA, a corruption of *Epiphania* (Epiphany), is the name given in Italy to a singular custom prevailing on Three Kings' Day (see BEAN-KING'S FESTIVAL), or Twelfth Night. According to tradition, the B. was an old woman who, being busy cleaning the house when the three wise men of the east passed by on their way to offer their treasures to the infant Savior, excused herself for not going out to see them on the ground that she would have an opportunity of doing so when they returned. They, however, went home by another way; and the B., not knowing this, has ever since been watching for their return. She is supposed to take a great interest in children, who on Twelfth Night are put earlier to bed, and a stocking of each is hung before the fire. Shortly, the cry "*Ecco la B.*" is raised; and the children, who have not gone to sleep, dart out of bed, and seize their stockings, in which each finds a present bearing some proportion in value to his conduct during the year. If any one has been conspicuously ill behaved, he finds his stocking full of ashes—the method the B. takes of expressing her disapprobation. It was also customary in Italy, on Twelfth Night, to carry an effigy called the B. in procession through the streets amid great rejoicings; but this, which was probably the relic of the celebration of a middle-age "mystery," has fallen greatly into disuse. The word is also used to awe naughty children.

BEF'FROI, or BELFRY, was the name of a tower used in the military sieges of ancient and mediæval times. When a town was to be besieged, a movable tower, as high as the walls, was brought near it; and this tower was the beffroi. Its use is more than once spoken of by Cæsar in his account of his campaigns in Gaul. Froissart describes, with his usual spirit, a B. employed at the siege of the castle of Breteuil in 1356. At the siege of Jerusalem by the crusaders, a B. was carried in pieces, put together just beyond bow-shot, and then pushed on wheels to a proper position. The object of such towers was to cover the approach of troops. Sometimes they were pushed on by pressure, sometimes by capstans and ropes. The highest were on six or eight wheels, and had as many as twelve or fifteen stories or stages; but it was usual to limit the height to three or four stages. They were often covered with raw hides, to protect them from the flames of boiling grease and oil directed against them by the besieged; and there was a hinged draw-bridge at the top, to let down upon the parapet of the wall, to aid in landing. The lower stage frequently had a ram (see BATTERING RAM); while the others were crowded with archers, arbalisters, and slingers; or there were bowmen on all the stages except the top, which had a storming or boarding party. During the wars under Charles I., the royalists made a B. to aid in the besieging of a town or castle in Herefordshire; it was higher than the defense-works, and was provided with loop-holes, a bridge, etc.; but the Roundheads captured it before it could be applied to use. Ducange thinks that the name of belfry (q.v.) given to a bell-tower, was derived from the warlike machine called the beffroi or belfry.

BEG, or BEY, a Turkish title, rather vague in its import, and commonly given to superior military officers, ship-captains, and distinguished foreigners. More strictly, it applies to the governor of a small district, who bears a horse-tail as a sign of his rank. The governor of Tunis has this title.—"Beglerbeg," or, more correctly, Beilerbegi ("lord of lords"), is the title given to the governor of a province who bears three horse-tails as his badge of honor, and has authority over several begs, agas, etc. This superior title belongs to the governors of Rumelia, Anatolia, and Syria.

BEGAS, KARL, court-painter to the king of Prussia, professor and member of the academy of art in Berlin, was b. there in 1794. He had been destined for the law, but

early manifested a love for art, and while at Bonn, received his first lessons in painting from Philippart. In 1811, he proceeded to Paris, and there spent eighteen months in the studio of the celebrated Gros. In 1815, Frederick William III., on the occasion of his visit to Paris, bought a large original painting by B. "Job surrounded by his Friends," and gave him two commissions for different churches in Berlin. This led to his moving thither in 1818, and to his subsequently residing in Italy at the king's expense. On his return to Berlin in 1825, he painted a great many biblical subjects for churches, as well as other pictures. He died 23d Nov., 1854. There are frescoes of colossal size by him in the new church of Sacrow, near Potsdam. He is especially distinguished for the animation and individuality of his portraits, and has painted for the king a gallery of celebrated authors and artists, including Humboldt, Schelling, etc. Several of his *genre* paintings have been rendered familiar by repeated engravings; and his works, in general, are eminent for expression, rich coloring, and a peculiarly clear chiaro oscuro.

BEGGAR, a person who solicits charitable aid from the public at large. The word is supposed to have some connection with the fraternity known as Beghards. See BEGUIN. The actual begging or solicitation of temporal aid became, however, so conspicuous a feature among these mendicant orders, that the term originally applied to their sacred duties seems at a very early period to have acquired its modern vulgar acceptation. There is no class of men who have had their lot and condition so varied by ethnical and social conditions as beggars. In a civilized industrious country, the B., to have any chance of relief, must manage to get it believed, whether it be true or false, that he is on the verge of want, and requires the solicited alms to keep him from starvation. Among oriental nations, on the other hand, beggars have often been a potent class, who may be rather considered as endowed with the privilege of taxing their fellow-creatures, than as objects of compassion. It has sometimes been supposed that a residue of this feeling of superiority characterizes the mental physiology even of the mendicant of civilization, and that, abject as he seems, he considers himself to some extent a privileged person, entitled to support from his fellows, without being amenable to the slavish drudgery by which the working-classes live. In Europe, during the middle ages, those doctrines of Christianity which are intended to teach us to abjure selfishness and worldly-mindedness, were exaggerated into a profession of total abstraction from worldly cares and pursuits. Hence arose the large body of religionists who, as hermits or members of the mendicant orders, lived on the contributions of others. In later times, the mendicant orders became the proudest and the richest of the clergy; but while the chiefs lived in affluence, the practices of the lower adherents fostered throughout Europe a system of mendicancy very inimical to civilization and industrial progress. In Great Britain its evil results have been long felt, in the inveterate establishment of practices naturally out of harmony with the independent, industrious character of the British people. Ever since the reformation, the British laws have had a death-struggle with the B.; but neither by the kindness of a liberal poor-law, nor by the severity of a merciless criminal code, have they been able to suppress him. When a country provides, as Britain does, that no one shall be permitted to starve, it would naturally be expected that the springs of miscellaneous charity would be dried. But it is not so, and it is indeed often plausibly urged, that entirely to supersede all acts of kindly generosity between man and man, through rigid legal provisions, must lower the standard of human character, by depriving it of all opportunity for the exercise of the generous emotions. It is clear that, in the light of political economy, promiscuous charity is the most costly and most corrupting way of administering relief to indigence. No one will maintain that the idle B. on the street deserves such a luxurious table as the industrious mechanic cannot afford to himself. But, at the same time, no one who drops a coin in a beggar's hat can say how many others may be deposited there during the day, and whether the B. is merely drawing a wretched pittance, or deriving a good income. Begging being a trade, it is not always those who are the poorest, but those who are the most expert, who will practice it to the best results. The great object is to seize on and appropriate any characteristic calculated, whether permanently or temporarily, to excite compassion. Hence periods of general distress are often the harvest of the B., and his trade rises and falls in an inverse ratio with that of the working community. Times of prosperity are not favorable to him, because he is then told that there is plenty of work for him. But when workmen are dismissed in thousands, and their families turned on the road to seek alms, the professional beggars, by their superior skill and experience, will be sure to draw the prizes in the distribution. Many surprising statements have been made of the large incomes made by skillful professional beggars, especially in London. The most remarkable anecdotes on the subject will be found in Grose's *Olio*, whence they have often been repeated. Attempts have been made, but with questionable success, to set forth an average statement of the earnings in different departments of the B. trade. A good deal of information of this kind will be found in the *Report of the Constabulary Force Commission of* 1839 (see p. 60, et seq.). It does not appear, however, that this trade is, like others, dependent on the law of supply and demand. The B. generally is so constitutionally, whether from hereditary or other physical causes. He has a loathing, even to horror, of steady systematic labor, and he will rather

submit to all the hardships and privations of the wanderer's lot, than endure this dreaded evil.

BEGGARS, THE LAW OF ENGLAND RELATING TO, is regulated by the 5 Geo. IV. c. 83 (amended in regard to other points by the 1 and 2 Vict. c. 38). By the third section of the 5 Geo. IV. it is enacted that every person wandering abroad, or placing him or herself in any public place, street, highway, court, or passage, to beg or gather alms, or causing or procuring, or encouraging any child or children so to do, shall be deemed *an idle and disorderly person;* and it shall be lawful for any justice of the peace to commit such offender to the house of correction, there to be kept for any time not exceeding one calendar month. And by section 4, it is further provided that any person so convicted, and offending in the same way again, shall be deemed *a rogue and a vagabond*, and may be punished by being committed to the house of correction for three months, with hard labor; and by the same section, every person wandering abroad and endeavoring, by the exposure of wounds or deformities, to obtain or gather alms, and every person going about as a gatherer or collector of alms, or endeavoring to procure charitable contributions of any nature or kind under any false or fraudulent pretense, shall be deemed *a rogue and vagabond*, and be punishable as before mentioned. By section 15, however, of the same act, the visiting justices of any county jail, house of correction, or other prison, may grant certificates to persons discharged, to receive alms on their route to their places of settlement; but if such persons shall act in a manner contrary to the directions or provisions of their certificates, or shall loiter upon their route, or shall deviate therefrom, they shall be deemed rogues and vagabonds, and punished accordingly. Other later statutes, however, enable justices to give aid to all prisoners on being discharged from prison, and supersede this doubtful license to beg on their way home. Many prisoners' aid societies are established in different parts of the country, and if their rules are good, they receive a certificate from the visiting justices of jails. When the time arrives for the discharge of a prisoner, the justices have power, out of the moneys under their control, to order a payment of £2, either to the prisoner, or the treasurer of the aid society, for his benefit; and they may also pay his railway fare, so that by this means he can always reach his home without begging.

The attempt or purpose to obtain money or alms by means of shows or entertainments on the streets of London, is also an offense under the metropolitan police act, 2 and 3 Vict. c. 47, s. 54 (No. 14), and punishable by a fine of 40 shillings.

In the Scotch law, there are many severe statutes of the Scotch parliament against beggars and vagabonds, all of which, along with the proclamations of the Scotch privy council on the same subject, are renewed and ratified by the act 1698, c. 21, which forms the existing Scotch law in regard to beggars. The Scotch poor-law amendment act, 8 and 9 Vict. c. 83, contains no provision on the subject. Anciently, in Scotland, legal permission to beg was given to certain sick and infirm poor persons, and in the reign of James V., a system of *tokens* for the same purpose was established.—See Burns' *Justice of the Peace*, vol. vi.; Charnock's *Police Guide*, Dunlop's *Parochial Law of Scotland*, Lorimer's *Hand-book of the Scotch Law*, and the works and authorities referred to in these publications.

BEGGAR-MY-NEIGHBOR, a game at cards usually played by two persons, between whom the cards are divided. Holding their cards with the backs upwards, the players lay down a card alternately, until an honor is played, which is paid for by the adversary —four cards for an ace, three for a king, two for a queen, and one for a knave; such payment being made, the winner lifts the trick. If, however, an honor should be laid down during the payment, then the opposite party must pay for that in the same way; and so on, till a payment is made without an honor. The game is played chiefly by children.

BEGHARDS. See BEGUINES, *ante*.

BEGHAR'MI, or BAGIR'MI, a country in Central Africa, bounded on the n. by lake Tsad; on the w. by the Shari, or Great river, which divides it from the kingdom of Bornou; and on the e. by the Waday kingdom. It extends southward to about lat. 10° north. Its greatest length is about 240 m., and its breadth 150. The whole of B. proper is flat, with a slight inclination towards the n.—its general elevation being about 1000 ft. above the level of the sea. The outlying provinces in the s.e. are slightly mountainous. B. has three considerable rivers flowing through and along its borders—the Bénuwé, Logan, and Shari; the last of which, augmented by the Logan, is upwards of 600 yards across at Mele. There is, in general, however, the utmost scarcity of water in the country, and the inhabitants guard their wells with jealous care. The soil is partly composed of sand, and partly of lime, and produces the grain and fruit common to countries of Central Africa. Worms and ants are very destructive to the crops. The ants appear to be a perfect pest. Dr. Barth describes them as eating through his matting and carpeting, and he had the utmost difficulty in preserving his goods from entire destruction by them. The total population is about a million and a half. From the numerous deserted villages with which the traveler constantly meets, the population would appear to have been much greater at one time. Mohammedanism has been introduced among them, but many are still pagans, and all are grossly superstitious. The only industrial arts are weaving and dyeing. Physically, they are a fine race of people,

superior to the tribes around them, the women being especially handsome. The men are subject to a peculiar disease in the little toe, called "mukárdam." It seems to be caused by a worm, which eats the toe away. One in ten of the male population are said to have lost their little toes through this cause. The sultan is absolute in his own dominions, and several smaller states are tributary to him; and he, in his turn, is tributary to the more powerful ruler of Bornou. The fighting-force of the kingdom is about 13,000 men. Masena (q.v.), the capital, has a circumference of about 7 miles.—Barth's *Travels in Central Africa*.

BEG'KOS, or BEI'KOS, a large village of Anatolia, on the Bosphorus, 8 m. n.n.e. of Scutari, said to be the locality of the contest between Pollux and Amycus, in which the latter was killed. See ARGONAUTS. At the commencement of the Crimean war, the allied fleets anchored in B. bay, prior to their entering the Black sea in Jan., 1854.

BEG'LERBEG. See BEG.

BEGONIA'CEÆ, a natural order of exogenous plants, the place of which in the system is doubtful, but is supposed by Lindley to be near *cucurbitaceæ* (q.v.). The B. are herbaceous or suffruticose plants, with alternate leaves, which are oblique at the base, and have large dry stipules. The flowers are in cymes, unisexual, the perianth colored, with 4 unequal divisions in the male flowers, and 5 or 8 in the female; the stamens are numerous; the fruit is membranous, winged, 3-celled, bursting by slits at the base, the seeds minute.—The order contains about 160 known species, all of which have pink flowers. They are almost all tropical plants, and some of them are often to be seen in British hot-houses; but a small species of *begonia* ascends the Himalaya to at least 11,500 ft., often growing on the trunks of trees. The leaves of the *begonias* have a reddish tinge. The leaves and young stems are succulent and acid, and those of *B. Malabarica, B. tuberosa*, and other species, are used as pot-herbs, or in tarts. The juicy stalks of a large species found in Sikkim, at an elevation of five or six thousand feet, are mentioned by Dr. Hooker as employed to make a pleasant acid sauce. This, and the small Himalayan species already mentioned, would probably succeed in the climate of Britain. The roots of some are used in their native countries as astringents, and some of the Mexican species are used as drastic purgatives.

BEG-SHEHR', a fresh-water lake of Asia Minor, Karamania, 44 m. s.w. of Koniyeh, presumed to be the ancient *Caralitis*. It is about 20 m. long, and from 5 to 10 m. broad. It contains many islands, and discharges itself by a river of the same name into lake Soglah. On its e. and n. shores are the towns of Begshehr and Kereli, the old *Caralio*, which issued imperial coins, and which is also supposed to have occupied the site of Pamphylia.

BEGTA'SHI, a religious order in the Ottoman empire, which had its origin in the 14th century. The name is believed to be derived from that of a celebrated dervise, Hadji Begtash, to whom also the order appears to owe its institution. The members use secret signs and pass-words as means of recognition, in the same way as is done by the masonic orders, some of them indeed appearing to be identical with those of free-masonry. Although numbering many thousands of influential persons in its ranks, the society does not appear to exercise any material influence in the religion or politics of Turkey.

BE'GUINES, BEGUI'NÆ, or BEGUT'TÆ, the name of the earliest of all lay societies of women united for pious purposes. The reason of their origin is not quite certain, but it is usually attributed—in part, at least—to the disproportion in the numbers of men and women which was occasioned by the crusades. These wars had robbed Christendom of thousands of its most vigorous sons, and left multitudes of widows and maidens, to whom life had henceforth something of a solemn and sorrowful aspect, and who therefore betook themselves, in earnest and affectionate piety, to the charities and duties of religion. The origin of the word is doubtful. The popular tradition of Brabant since the 17th c., that a St. Begga, daughter of Pepin, and sister of St. Gertrude, founded, in 696, the first sisterhood of B. at Namur, has no historical basis. Hallmann has also shown that the supposed oldest document of the B. (1065), giving an account of their establishment at Vilvorde, near Brussels, is unauthentic. The most probable account is, that a priest named Lambert le Bègue, or Le Bèghe, i.e., the stammerer, about the year 1180, founded, in Liege, a society of pious women, who were called by his name. The B. were not restricted by vows, nor did they follow the rules of any order, but were united under a *supérieure* for the exercise of piety and benevolence, and lived generally in separate small cottages, which, collectively, formed the *beginagium*, or "*vineyard*," as it was scripturally termed. Their establishments were often enriched by liberal donations. A church, a hospital, and a house of reception or common entertainment, generally belonged to every community of beguines. The sisters were distinguished from the rest of the laity only by their diligence and devotedness, piety, modesty, and zeal for the purity of youthful education. Societies of B. flourished greatly during the 12th and 13th c., when they spread themselves over France and Germany. Among the most important were those in Hamburg, Lübeck, Regensburg, Magdeburg, Leipsic, Goslar, Rochlitz, and Görlitz. As the pietists of the middle ages, the B. were often subjected to persecution by the mendicant orders of friars; but, on account of their practical usefulness,

were sheltered by the pope and councils as well as by secular authorities. In the 13th and 14th c., the B. became united with the persecuted spiritualists among the Franciscans (*fratricelles*), and with the sect of the "brethren and sisters of the free spirit." Hence arose certain heresies, which, of course, occasioned interference on the part of the inquisition; and on account of certain immoralities, a synod held at Fritzlar required that all candidates must be 40 years old before they could enter a society of beguines. These sisterhoods maintained their position in Germany and the Netherlands longer than in other countries. In Holland, they existed at the close of the 18th c.; and in the present day we find here and there so-called *Beguinen-häuser* (beguin-houses) in Germany; but they are now nothing more than almshouses for poor spinsters. At Ghent, there is still a celebrated institution of B., numbering as many as 600 sisters, besides 200 *locatrices*, or occasional inmates. Their houses form a kind of distinct little town, called the Béguinage, which, though environed by a wall, is open to the visits of strangers. Living here a life of retirement and piety, the B., in their simple dark dresses, go out as nurses to the hospital, and perform other acts of kindness among the poor. As above stated, they are under no monastic vow, but having attached themselves to the sisterhood, it is their boast that none is known to have quitted it. There are houses of B. also at Antwerp, Mechlin, and Bruges; and in 1854, one was established in France, at Castelnaudary, in the department of Aude.

BEGHARDS (Ger. *begehren*, to seek with importunity). Societies of laymen styling themselves *B.*, first appeared in Germany, the Netherlands, and the s. of France in the beginning of the 13th c., and were known in Italy as *bizachi* and *bocasoti;* but they never obtained the reputation enjoyed by the beguine sisterhood. Towards the end of the 13th c., they were commonly stigmatized as *bons garçons, boni pueri,* "ministers' men," "bedesmen," "pietists," "vagabonds"—contemptuous titles, which expressed the low estimation in which they were held. On account of heretics of all sorts retreating into these half-spiritual communities, they were subjected to severe persecutions after 1367, and were gradually dispersed, or joined the orders of Dominicans and Franciscans. In the Netherlands, where they had preserved a better character than elsewhere, they maintained their ground longer, and were protected by pope Innocent IV. (1245), in Brussels by cardinal Hugo (1254), and in Liege by pope Urban IV. (1261); but their communities disappeared in the 14th century.—See Mosheim, *De Beghardis et Beguinabus* (Leip. 1790), and Hallmann's *Geschichte des Ursprungs der Belg. Beghinen* (History of the Origin of Beguines in Belgium), Berlin, 1843.

BEGUM, the feminine of "Beg," meaning "lord" or "prince," bestowed upon sultanas and East Indian princesses.

BEHAIM, MARTIN, a famous cosmographer, descended from a Bohemian family which settled in Nuremberg after the middle of the 13th c., and still flourishes there. Behaim was b. in Nuremberg in 1430 (or, more probably, in 1436). He early entered into mercantile life, and went to Venice (1457), and to Mechlin, Antwerp, and Vienna (1477–79), in pursuit of trade. In 1480, he was induced to go to Portugal, where he soon acquired a reputation as a skillful maker of maps. From 1484 to 1485, he accompanied the Portuguese navigator, Diego Cam, in a voyage of discovery along the w. coast of Africa, and sailed as far as the mouth of the Zaire or Congo river, in lat. 22° s., which was 19½° further than had ever been previously reached. In 1486, Behaim sailed to Fayal, one of the Azore islands, where a Flemish colony had settled. Here he married the daughter of Jobst von Küster, governor of the colony. In 1490, he left Fayal, and returned to his native city, Nuremberg, where he resided from 1491 to 1493. During this stay, he constructed a large globe, principally from the writings of Ptolemy, Pliny, Strabo, Marco Polo, and Sir John Mandeville. It is still preserved by the family of Behaim, in Nuremberg, and is a valuable record of the progress of discovery, though it indicates that Behaim's geographical knowledge did not at that period extend beyond Japan on the e., and the Cape Verd islands on the west. After traveling through Flanders and France, Behaim again resided in Fayal from 1494 to 1506, and then removed to Lisbon, where he died, July 29, 1509. The services rendered by Behaim to geographical discovery and the science of navigation were considerable, though, according to the latest investigations, there is no support for the theory that Behaim was the discoverer of America, or even that Columbus and Magelhaen were indebted to Behaim for guidance with regard to their discoveries. Behaim left no works behind him except his maps and charts.—Murr's *Diplomatische Geschichte des Ritters von B.* (1778–1801); A. von Humboldt's *Examen Critique de l'Histoire de la Géog. du Nouveau Continent* (1836).

BEHAR. See BAHAR.

BEHEADING. See CAPITAL PUNISHMENT.

BE'HEMOTH, a large animal mentioned in the book of Job. Scholars are undecided whether it means the elephant, rhinoceros, hippopotamus, or crocodile; but as the animal was both of land and water, and fed upon grass, a number believe the hippopotamus was meant.

BEHISTUN', or BISUTUN' (Lat. *Bagistanus;* Persian, *Baghistan*, place of gardens), a ruined town of the Persian province of Irak-Ajemi, 21 m. e. of Kirmanshah, lat. 34° 18′ n., long. 47° 30′ e. B. is chiefly celebrated for a remarkable mountain, which on one side

rises almost perpendicularly to the height of 1700 ft., and which was in ancient times sacred to Jupiter or to Ormuzd. According to Diodorus, Semiramis, on her march from Babylon to Ecbatana, in Media Magna, encamped near this rock, and having cut away and polished the lower part of it, had her own likeness and those of a hundred of her guards engraved on it. She further, according to the same historian, caused the following inscription in Assyrian letters to be cut in the rock: "Semiramis having piled up one upon the other the trapping of the beasts of burden which accompanied her, ascended by these means from the plain to the top of the rock." No trace of these inscriptions is now to be found, and sir Henry Rawlinson accounts for their absence by the supposition that they were destroyed "by Khusraú Parvíz when he was preparing to form of this long scarped surface the back wall of his palace." Diodorus also mentions that Alexander the great, on his way to Ecbatana from Susa, visited Behistun. But the rock is especially interesting from its cuneiform inscriptions (q.v.), which within recent years have been successfully deciphered by sir H. Rawlinson. The principal inscription of B., executed by the command of Darius, is on the n. extremity of the rock, at an elevation of 300 ft. from the ground, where it could not have been engraved without the aid of scaffolding, and can now only be reached by the adventurous antiquary at considerable risk to his life. The labor of polishing the face of the rock, so as to fit it to receive the inscriptions, must have been very great. In places where the stone was defective, pieces were fitted in and fastened with molten lead with such extreme nicety, that only a careful scrutiny can detect the artifice. "But the real wonder of the work," says sir H. Rawlinson, "consists in the inscriptions. For extent, for beauty of execution, for uniformity and correctness, they are perhaps unequaled in the world. After the engraving of the rock had been accomplished, a coating of silicious varnish had been laid on, to give a clearness of outline to each individual letter, and to protect the surface against the action of the elements. This varnish is of infinitely greater hardness than the limestone rock beneath it." Washed down in some places by the rain of twenty-three centuries, it lies in consistent flakes like thin layers of lava on the foot-ledge; in others, where time has honey-combed the rock beneath, it adheres to the broken surface, still showing with sufficient distinctness the forms of the characters. The inscriptions—which are in three forms of cuneiform writing, Persian, Babylonian, and Medean—set forth the hereditary right of Darius to the throne of Persia, tracing his genealogy, through eight generations, up to Achæmenes; they then enumerate the provinces of his empire, and recount his triumphs over the various rebels who rose against him during the first four years of his reign. The monarch himself is represented on the tablet with a bow in hand, and his foot upon the prostrate figure of a man, while nine rebels, chained together by the neck, stand humbly before him; behind him are two of his own warriors, and above him, another figure. The Persian inscriptions which sir H. Rawlinson has translated are contained in the five main columns numbered 1, 2, 3, 4, 5. The first column contains 19 paragraphs and 96 lines. Each paragraph after the first, which commences, "I am Darius the Great King," begins with, "Says Darius the King." The second column has the same number of lines in 16 paragraphs; the third, 92 lines and 14 paragraphs; the fourth has also 92 lines and 18 paragraphs; and the fifth, which appears to be a supplementary column, 35 lines. With the exception of the first paragraph on the first column, all begin with, "Says Darius the King." The second, fourth, and fifth columns are much injured. Sir H. Rawlinson fixes the epoch of the sculpture at 516–515 B.C. See *Journal of Asiatic Society*, vol. x.

BEHME, JACOB. See BÖHME.

BEHN, APHARA, or APHRA, a licentious authoress of the reign of Charles II., the date of whose birth is unknown, was the daughter of Mr. Johnson of Canterbury, a gentleman who, through his aristocratic connections, obtained the appointment of governor of Surinam. He died on his passage out, but the daughter pursued her journey, and resided at Surinam for some considerable time. Here she made the acquaintance of the celebrated slave Oronoko, who afterwards became the subject of one of her novels, and of a tragedy by Southern. Returning to England, she married Mr. Behn, a merchant of Dutch extraction, was presented at court, where her personal appearance and vivacious freedom of manners pleased the "merry monarch," who deputed her to watch events in Flanders. She accordingly went to Antwerp, where she succeeded in discovering the intention of the Dutch to sail up the Thames and Medway, and communicated the secret to the English court; which, however, took no notice of the information, a slight which caused the fair agent to throw up state politics in disgust. On her return to England, she became intimate with all the profligate wits as well as the more staid scholars and poets of the time, and devoted herself to literature. Her numerous plays, poems, tales, letters, etc., are disfigured alike by general impurity of tone and indecency of language; and, in point of intellectual ability, none of her works deserves the high praise lavished on them by Dryden, Cotton, Southern, and others. She died in 1689. Her works were reprinted in 4 vols. 1872.

BEHRING, or **BERING**, VITUS, a famous navigator, b. in 1680 at Horsens in Denmark. In 1704, he entered as captain in the newly-formed navy of Peter the great. From the ability and daring he displayed in the wars with Sweden, he was appointed to conduct an expedition of discovery in the sea of Kamtchatka. Sailing, in 1728, from a port

on the e. of Kamtchatka, he followed the coast northward until he believed, from the westward trending of the land, that he had reached the n.e. point of Asia. It is now, however, believed that the cape which B. rounded was to the s. of the real East cape (in lat. 66°), and that he never actually reached the strait to which he has given his name. After some years spent in explorations on the coasts of Kamtchatka, Okhotsk, and the n. of Siberia, he sailed in 1741 from Okhotsk towards the American continent, and sighting land about 58½° n. lat., he followed the coast northward for some distance; but sickness and storms obliged him to return, and being wrecked on the desert island of Awatska, since called Behring's island, he died there, 8th Dec., 1741. The previous year, he had founded the present settlement of Petropaulovski, in the bay of Awatska.

BEHRING ISLAND, the most westerly of the Aleutian group, in the n. Pacific, 55° 22′ n., 166° e.; the place where the navigator, Behring, was wrecked in 1741. It is rocky and desolate; pop. about 2500, composed of natives and seal fishers.

BEHRING SEA, the sea of Kamtchatka, the extreme n. part of the Pacific ocean; connected by B. straits with the Arctic ocean; extends s. to the Aleutian islands, and from Alaska to the shores of Asia.

BEHRING'S STRAIT separates Asia from America, and connects the Pacific with the Arctic ocean. The proof that the two continents were not connected was given by the voyage of a Cossack named Deschnew, who, in 1648, sailed from a harbor in Siberia, in the Polar ocean, into the sea of Kamtchatka. But the whole voyage was long regarded by Europeans as a fable, until Behring's (q.v.) expedition in 1728. The strait has since been explored by Cook and Beechy. The narrowest part is near 66° lat., between East cape in Asia, and cape Prince of Wales in America. The distance between the two capes, in a direction from n.w. to s.e., is nearly 50 m.; about midway are 3 uninhabited islands. The greatest depth, some 30 fathoms, is towards the middle, and the water is shallower towards the American coast than the Asiatic. A very old Japanese map in the British museum shows the leading features of this strait very accurately.—BEHRING'S SEA, a part of the n. Pacific ocean, commonly known as the sea of Kamtchatka, bounded w. by Kamtchatka, e. by Alaska, s. by the Aleutian islands, and n. by Behring's strait. There are several islands in this sea, and fogs prevail constantly; but owing to the shallowness of the strait, there are no icebergs of magnitude to be met with.—BEHRING'S ISLAND, the most westerly of the Aleutian islands in lat. 55° 22′ n., long. 166° e. It has an area of 30 sq.m., and is noteworthy as the place where Behring, the discoverer, was wrecked and died in 1741.

BEILAN', a pass and t. in the northern extremity of Syria, on the e. shore of the gulf of Iscanderoon. The pass of B. runs from s.w. to n.e., between the mountain ranges of Rhosus and Amanus, and is the common route from Cilicia into Syria. It is one of the two Amanian passes, supposed to be the lower one, mentioned by Cicero as capable of easy defense on account of their narrowness. There seems to be no doubt that, in the war between Darius and Alexander, the Beilan pass was an important consideration to both commanders, but historians and geographers appear to be at variance as to the precise advantage taken of it in the struggle. The town of B. is situated near the summit level of the pass, at an elevation of 1584 feet above the Mediterranean sea. It has a population of about 5000, many of whom are wealthy, and is much esteemed for its salubrity and fine water, which is supplied by numerous aqueducts. Between the north-western foot of the pass and the sea, are caves and springs, supposed to be the site of the ancient Myriandrus. B. was the scene of a battle between the Egyptians and Turks in 1832, when the latter were defeated.

BEIRA, a Portuguese province, bounded n. by the provinces of Minho and Tras-os-Montes; s. by Estremadura and Alemtejo; e. by Spain; and w. by the Atlantic ocean. It has an area of about 9222 sq.m., and a pop. '74, of 1,390,092. The surface is mountainous, and the soil on the plains sandy, and generally far from fertile. The mountain slopes afford good pasturage for sheep and cattle. The products are corn, wine, oil, flax, and various kinds of fruit, and considerable attention is paid to the rearing of bees. Sea-salt is obtained at the coast. The river Douro waters the whole of its northern, and the Tagus, a portion of its southern, boundary. The Mondego and Vouga flow through its center. Iron, coal, and marble are wrought in small quantity. There is little done in manufactures. The inhabitants are an industrious race of people. In 1835, the province was divided into upper and lower Beira, the former having Viseu and the latter Castel Branco, for its capital.

BEIRAM, or BAIRAM, a Mohammedan festival somewhat analogous to Easter. It commences immediately after the fast of ramadan, or ramazan, which corresponds to Lent. Being one of the only two feasts the Moslems have in the year, it is looked forward to with great interest, the zest being enhanced by the previous abstinence. Its advent is announced at Constantinople by the discharge of artillery, the beating of drums, and blowing of trumpets. Properly, it should terminate in one day, but the Moslems in the capital think it no offense to their abstemious prophet to carry the festivities over two days; while in other parts of Turkey and Persia, they are often protracted for a week or more. Dances, music, processions, etc., in which the women are permitted greater indulgence than usual, form prominent features of the feast; and at

this time the different orders of the empire pay homage to the sultan. Seventy days after, the Moslems celebrate their only other feast ("the festival of the sacrifices"), called the *lesser* B., which is the day appointed by the Mecca pilgrims for slaying the victims, and was instituted in commemoration of the offering up of Isaac by Abraham. The lesser B. usually lasts three days, but it is not celebrated with anything like the pomp of the other. During the continuance of each of the festivals, only one religious service takes place. The Mohammedan year being the lunar one of 354 days, in the course of 33 years the festivals run through all the seasons:

BEISSEL, JOHANN CONRAD, 1690–1768; a German who emigrated to Pennsylvania in 1720 and established at Ephratah the religious community of seventh-day Baptists, or Dunkers. He wrote a number of books upon religious subjects.

BEIT is an Arabic word, signifying house, abode, or place, the equivalent of which in Hebrew is *beth*. Thus, in the former language, we have *beit-al-harâm*, "the house of the sanctuary," or "the sacred house;" and in the latter, *Beth-el*, "house of God;" *Beth-any*, "place of dates;" *Beth-abara*, "place of fords," etc.

BEIT-EL-FA'KIH (house of the saint), a t. of Tehama, on the Red sea. Being the frontier town of the Egyptian government, it has a considerable trade in coffee, wax, gum, etc., which articles are exchanged for Indian piece goods and British shawls. It has a pop. of about 8000, and a citadel of some strength. The houses are built partly of mud and partly of brick, and roofed with branches of the date-tree. It is described by travelers as the hottest town in Tehama.

BEITUL'LAH (Arab., house of God), the spacious building or temple at Mecca, which contains the Kaaba. See MECCA and KAABA.

BE'JA (the *Pax Julia* of the ancients), a t. in the province of Alemtejo, Portugal, 36 m. s.s.w. of Evora, with a pop. of 6500. It is fortified, its walls being flanked by 40 towers, has a castle and a cathedral, and manufactories of leather and earthenware.

BE'JAN, or BA'JAN, the name of the first or "freshman" class in some at least of the Scotch, and of old in many continental universities. The word is believed to be derived from the French *bec-jaune*, or yellow neb, a term used to designate a nestling or unfledged bird. The levying of *bejaunia*, or payments for "first-footing" by students on entering college, was forbidden by the statutes of the university of Orleans in 1365, and of the university of Toulouse in 1401. The election of an *Abbas Bejanorum*, or "Abbot of the Greenhorns," was prohibited by the statutes of the university of Paris in 1493. In the university of Vienna, the *bejan* was called *beanus*, a word of the same meaning, and no doubt of the same origin.

BEJAPUR', a decayed city in the presidency of Bombay, lat. 16° 50′ n., and long. 75° 48′ e. It is situated to the s.e. of Bombay, Poonah, and Satara, at the respective distances of 245, 170, and 130 m., being on an affluent of the Kistna or Krishna, which flows into the bay of Bengal, and nearly touching the w. border of the Nizam's territories. B. was for centuries the flourishing capital of a powerful kingdom, falling therewith under various dynasties in succession, Hindu and Mussulman, till, in 1686, it was captured by Aurungzebe. Thus stripped of its independence, B. speedily sank into the shadow of a mighty name, passing, during the early part of the 18th c., into the hands of the Mahrattas. On the overthrow of the Peishwa, in 1818, it was assigned by the British to the dependent rajah of Satara; but resumed on the extinction of the reigning family in 1848. Now that a gradual decay has done its work, B. presents a contrast perhaps unequaled in the world. Lofty walls, of hewn stone, still entire, inclose the silent and desolate fragments of a city which is said to have contained 100,000 dwellings. With the exception of an ancient temple, the sole relic of aboriginal domination, the ruins are Mohammedan, and consist of beautiful mosques, colossal tombs, and a fort of more than 6 m. in circuit, with an inner citadel. An additional wonder of the place is, perhaps, the largest piece of brass ordnance in existence, cast at Ahmednuggur, where the mold may still be seen. Latterly, the rajah of Satara and the British government have done everything to prevent further decay. Pop. '72, 13,245.

BEJAR, a fortified t. of Spain, in the province of Salamanca, and about 45 m. s. of the capital of the province. It has cloth manufactures, and an annual fair at which a considerable cattle trade is transacted. It has warm saline springs, and gives its title to a ducal family who have a palace within its walls. Pop. 10,683.

BEKAA, the Cœle-Syria of the ancients, the "plain of Lebanon" of the Old Testament, and El Bekaa (the Valley) of the natives of Syria, is inclosed between the parallel ranges of Lebanon and Anti-Lebanon, which mountains it divides, and extends about 90 m. from n. to s., its greatest width being about 12 miles. It is the most rich and beautiful plain in Syria; but although the soil is good, and water abundant from the numerous mountain springs, a very small portion of it is cultivated. It is very much frequented by the Arabs, who bring down their young horses in the spring-time to graze on the plain.

BEKE, CHARLES TILSTONE, PH.D., etc., a modern English traveler, was born in London, Oct. 10, 1800; received a commercial education; afterwards studied law in Lincoln's Inn, and devoted a great part of his attention to ancient history, philology,

and ethnography. The results of these studies first appeared in his work, *Origines Biblicæ*, or researches in primeval history, vol. i. Lond. 1834). His (historical and geographical studies of the east led B. to consider the great importance of Abyssinia for intercourse with Central Africa; but his proposals to undertake an exploring journey were declined by the government, and by several learned societies. Supported only by private individuals, he joined in Abyssinia the party led by maj. Harris, and distinguished himself by the exploration of Godshem, and the countries lying to the s., previously almost unknown in Europe. The results of these researches appeared partly in several journals, and in *Abyssinia, a Statement of Facts*, etc. (2d ed., Lond. 1846). Having returned to Europe, he excited the attention of geographers by his publications: the *Essay on the Nile and its Tributaries* (Lond. 1847); *On the Sources of the Nile* (1849); and by his *Mémoire Justificatif en Réhabilitation des Pères Paez et Lobo* (Paris, 1848). In 1851, Dr. and Mrs. B. made a journey to Harran; and undertook in 1865 a fruitless mission to Abyssinia, to obtain the release of the captives. At the commencement of 1874, Dr. B. started for the region at the head of the Red sea, where he claimed (though his views are disputed) to have discovered Mt. Sinai e. of the gulf of Akabah, and not w. as generally supposed. He died in July of the same year, being engaged at the time on an account of his journey to Sinai. He had enjoyed a civil list pension since 1870.

BEKES, or BEKESVAR, a t. of Hungary, capital of the co. of the same name, and situated at the confluence of the Black and White Körös. Pop. '69, 22,547, who do a trade in cattle, corn, and honey.

BEKKER, BALTHAZAR, 1634–98; a Dutch divine, author of several works in philosophy and theology, the most celebrated being *The World Bewitched*, in which he critically examines the phenomena ascribed to the agency of spirits, and exposes many of the absurdities about Satan that had become articles of religious faith. This book was so offensive to the clergy that B. was deposed from the ministry.

BEKKER, IMMANUEL, a German philologist, distinguished by his recensions of the texts of Greek and Roman classics, was b. in Berlin, 1785; studied in Halle, 1803–07, and was the most eminent pupil of F. A. Wolf. Afterwards, he was engaged at Paris on the *Corpus Inscriptionum Græcarum*. The results of his researches in the libraries of Italy (1817–19) appear in his *Anecdota Græca* (3 vols., Berlin, 1814–21), and his numerous recensions of texts derived solely from MSS., and independently of printed editions. The writers included in these recensions are Plato, the Attic orators, Aristotle, Sextus Empiricus, Thucydides, Theognis, Aristophanes, etc. He became professor at Berlin in 1810, and died in 1871.

BEL. See BAAL, *ante*.

BELA, the name of four Hungarian kings of the family of Arpad.—B. I. (1061–63) energetically suppressed the last attempt to restore heathenism, and by the introduction of a fixed standard of measures, weights and coinage, virtually founded the commerce of Hungary. He was also the first to introduce the representative system into the diet, by appointing, in lieu of the collective nobility, two nobles only from each of the different counties.—B. II., surnamed "the Blind," 1131–41, was entirely under the guidance of his bloodthirsty spouse, Helena, and after her decease, drank himself to death.—B. III., 1174–96. Educated in Constantinople, he introduced Byzantine customs and culture into his own country, which was certainly favorable to its social development, though, on the other hand, his evident devotion to the Greek emperor Emmanuel threatened its political independence.—B. IV., 1235–70, son of that Andreas from whom the nobles extorted the "Golden Bull," Hungary's magna charta. His chief aim was to humble the nobility, and restore the royal power to its former proportions; and he thus roused a spirit of universal discontent, which led to a party among the nobles calling in the Austrian duke, Frederick II., to their aid; but, in the year 1236, he was conquered by B., and forced to pay tribute. Before long, however, the king had to seek a refuge with his discomfited foe; for the Mongols, who invaded Hungary in 1241, defeated him on the Sajo, and put him to flight. It was only after robbing him of all the treasure he had managed to save, and extorting from him three of his counties, that Frederick II. granted the royal fugitive a shelter in Austria, where he remained till the Mongols, having heard of the death of their khan, left the country they had devastated. B. now made it his especial care, by rebuilding the destroyed villages, and inviting new settlers thither, to do away with the tokens of that terrible invasion; and he so far succeeded as to be able, in 1246, to repay Frederick's inhospitality by defeating him at Vienna, and to repulse a second attempt at Mongolian invasion. He died in 1270, his last years having been embittered by an attempt at rebellion on the part of his son Stephen.

BELAI'A, BIELAJA, or BIELA, a river in the department of Orenburg, Russia, emptying into the Kama, after a course of about 600 miles.

BEL AND THE DRAGON, an apocryphal book of the Old Testament. It does not seem to have been accepted as inspired by the Jewish church, nor is there any proof that a Hebrew or Chaldee version of the story ever existed. Jerome considered it a "fable," an opinion in which most modern readers will coincide. It is, nevertheless, read for edification both in the Roman Catholic and Anglo-Catholic churches: in the former, on

Ash Wednesday; in the latter, on the 23d of November. According to Jahn, the aim of the writer was "to warn against the sin of idolatry some of his brethren who had embraced Egyptian superstitions."

BELAYING, one of the many modes of fastening ropes on shipboard. It is effected by winding a rope, generally a part of the running rigging, round a piece of wood called a cleat or a kevel, or else round a belaying-pin, which is an ashen staff from 12 to 16 in. in length.

BELBEYS' (ancient *Bubastis Agria*), a t. of 5000 inhabitants, situated on the e. arm of the Nile, lower Egypt, and 28 m. n.n.e. of Cairo. It is inclosed by earthen ramparts, has numerous mosques, and is one of the stations on the route from Cairo to Suez, and from Egypt to Syria.

BELCHER, Sir EDWARD, a distinguished English naval officer, born in 1799, entered the navy in 1812 as a first-class volunteer, was soon made a midshipman, and in 1816 took part in the bombardment of Algiers. In 1825, B. was appointed assistant-surveyor to the expedition about to explore Behring's strait under capt. Beechey; in 1829, he was raised to the rank of commander. 1836 saw him in command of the *Sulphur*, commissioned to explore the western coasts of America and the Indies. He was absent six years, in which time he had sailed round the world. During this voyage he rendered important services in the Canton river to lord Gough, whose successes over the Chinese were greatly due to B.'s soundings and reconnaissances pushed into the interior. On his return, he published a narrative of the voyage; and in 1843, in consideration of his services, he was made a post-captain, and knighted. After being employed on surveying service in the East Indies, he was, in 1852, appointed to the command of the expedition sent out by government to search for sir John Franklin. B. published *The Last of the Arctic Voyages* (Lond. 1855); *Narrative of a Voyage to the East Indies in* 1843-48; and other works. In 1861, he became rear-admiral of the red, in 1866 vice-admiral, in 1867 K.C.B., and rear-admiral in 1872. He died 18th Mar., 1877.

BELCHER, JONATHAN, 1681-1757; colonial governor of Massachusetts from 1730-1741. He was a native of the colony, and a graduate of Harvard. In 1747, he was governor of the province of New Jersey, where he passed the latter part of his life.

BELCHITÉ, a t. of Spain, in the province of Saragossa, about 22 m. s.s.e. of the city of that name, celebrated as the place where, on June 18, 1809, the French, under Suchet, completely routed the Spanish under gen. Blake, capturing all their guns, 10 in number, with a loss of only 40 men. It has woolen manufactures. Pop. over 3000.

BELED-EL-JEREED, a region of n. Africa between Algeria and the great desert, e. of Morocco. It is noted only for the production of dates.

BELEM,' a t. of Portugal, on the right bank of the Tagus, 2 m. s.w. of Lisbon, of which it may said to form a fashionable suburb. It has an iron foundry, a custom-house, and quarantine establishment, a tower defending the entrance of the river. It is historically interesting as the place from whence Vasco da Gama set sail on his voyage of oriental discovery. It was taken in Nov., 1807, by the French, the royal family of Portugal embarking from its quay for Brazil as they entered. In 1833, it was occupied by Dom Pedro's troops. Pop. 5000.

BELEM', or PARA', a city of Brazil, on the right bank of the Para, the most southerly arm of the estuary of the Amazon. See PARA.

BE'LEMNITES (Gr. *belemnon*, a dart or arrow), an interesting genus of fossil cephalopodous *mollusca*, the type of a family called *belemnitidæ*, to the whole of which the name B. is very generally extended, closely allied to the *sepiadæ*, or cuttle (q.v.) family. No recent species of B. is known: fossil species are very numerous, and are found in all the oolitic and cretaceous strata, from the lowest lias to the upper chalk, some of which are filled with myriads of their remains. These remains are generally those of the shell alone, which is now known to have been an internal shell, entirely included within the body of the animal, like that of the cuttle. The shell, as seen in the most perfect specimens, is double, consisting of a conical chambered portion (the *phragmocone*), inserted into a longer, solid, somewhat conical or tapering, and pointed sheath. The space between the phragmocone and sheath is occupied either with radiating fibers or conical layers. The chambers of the shell are connected by a tube (*siphuncle*), so that the animal probably had the power of ascending and descending rapidly in the water. Its arms are known, from some singularly perfect specimens, to have been furnished with horny hooks; and these it probably fixed upon a fish, and descended with its prey to the bottom, like the hooked calamary (q.v.) of the present seas. Remains of an ink-bag, like that of the cuttle, have been found in the last and largest chambers of the B.; but remains of this chamber, which must have contained all the viscera of the animal, are very rarely preserved, the shell having been very thin at this part. The part most commonly found, and generally known by the name of belemnite, is the solid *mucro*, or point into which the sheath was prolonged behind the chambered shell. These have received such popular names as arrowheads, petrified fingers, specter-candles, picks, thunderstones, etc., from their form, or from the notions entertained of their nature and origin. B. appear to have been of very different sizes; in some of the largest, the mere *mucro* is 10

in. long, and the entire animal, with its arms outstretched, must have been several feet in length

BELFAST, the chief t. of the co. of Antrim and province of Ulster in Ireland. This great seaport stands at the embouchure of the Lagan, at the head of Belfast lough, 12 m. from the Irish sea, 101 n. of Dublin, 36 n.e. of Armagh, 130 s.w. of Glasgow, and 150 n.w. of Liverpool. The site is chiefly on an alluvial deposit not more than 6 ft. above the sea-level, and reclaimed from the marshes of the Lagan. On the land side, it is picturesquely bounded by the ridges of Divis (1567 ft. high), and Cave hill (1185 ft.). The general aspect of B. is indicative of life and prosperity, exhibiting all the trade and manufacture of Glasgow and Manchester, with far less of their smoke and dirt. Many of the streets, especially in the White Linen Hall quarter, are well built and spacious. The mercantile quarter lies chiefly near the extensive and well-built quays. The manufactories are mostly on the rising ground on the n. and w. of the town. Numerous villas sprinkle the northern shores of the bay, as well as the elevated suburb of Malone to the south. The chief public buildings are—Queen's college, a beautiful structure in the Tudor style, opened in 1849, with a revenue of £7000 from the consolidated fund; royal academical institution, incorporated in 1810, affiliated to the London university, and comprising an elementary and collegiate department, and a school of design; museum, Linen hall, commercial and corn exchanges, churches, and banks. The fine botanic gardens of the natural history society occupy 17 acres. B. is the chief seat of the trade and manufactures of Ireland, and is second only to Dublin as an Irish port. The staple manufactures are linen and cotton. The linen manufacture dates from 1637. Cotton-spinning by machinery dates from 1777, and linen from 1806. The other chief branches of industry are linen and cotton weaving, bleaching, dyeing, calico-printing, and iron-founding. There are many flour and oil mills, chemical works, breweries, alabaster and barilla mills, saw-mills, ship-building, rope, and sail-cloth yards. The iron ship-building yard on Queen's island employs upwards of 2000 hands. The inland trade is carried on by the Lagan, the Ulster canal, and three railways. The harbor has recently undergone very extensive improvements, adding 25 acres of area to the dock accommodation, and a mile of quayage, making B. one of the first-class ports of the United Kingdom. Before the recent improvements there were only 2 tidal docks; since 1866, 4 new docks and a tidal basin have been opened. On these a sum of £369,927 was expended, the assets of the commissioners being £938,421. In 1877, 8913 vessels, of an aggregate tonnage of 1,770,685 tons, entered the port; and 5625, of 1,357,021 tons, cleared. The customs duties in 1877 amounted to £488,930. The most important branch of commerce is the channel trade. In 1879, 16 newspapers were published in B. Pop. '21, 37,000; '51, 103,000; '71, 174,412. B. is governed by a corporation of 10 aldermen—one being mayor—and 30 councilors. It returns 2 members to parliament. B. was destroyed by Edward Bruce in the 14th c., but became an important town since 1604, receiving a charter in 1611. In the great civil war, the inhabitants at first joined the parliament, but afterwards became royalists.

BELFAST, a seaport in Waldo co., Me., on Penobscot bay, 30 m. from the ocean, at the terminus of the Belfast division of the Maine Central railroad. There is a good harbor, and some activity in ship-building and fisheries. Pop. '70, 5278.

BELFORT, or BEFORT, a t. of France, capital of the French remnant of the department of Haut-Rhin. From 1870 till 1879 this remnant (234 sq.m.), taking its name from the town, was called the *Territoire de Belfort*, and consisted of those portions of Haut-Rhin which, seized by Germans during the war of 1870–71, were restored to France by the preliminaries of peace arranged at Versailles, 26th Feb., 1871. The strategical importance of B. was recognized by France on its cession by Austria in 1648, and it was fortified by Vauban. At the outbreak of the war between France and Germany in 1870, B. was a fortress of the first rank; and as such maintained, from 3d Dec., 1870, till 16th Feb., 1871, a gallant defense against the German troops. It then capitulated, the defenders being permitted to march out with all the honors of war. B. was also besieged by the allies in 1814. B. has a brisk trade. Pop. '76, 15,103; of territory, '76, 68,600.

BELFRY (Fr. *beffroi*), a word of doubtful origin; a bell-tower, or turret, usually forming part of a church, but sometimes detached from it—as at Evesham and Berkeley, in England, and still more frequently in Italy. See CAMPANILE. Where a church was built in a deep glen, the B. was perched on a neighboring height, as at St. Feve and elsewhere in Cornwall, and at Ardclach and Auldbar in Scotland. At this last place, the bell was hung upon a tree, as was common enough in Scotland at the close of the 17th century. Where the B. consists of a mere turret, it is often called a *bell-gable* or *bell-cote*, and is always placed on the w. end of the church; a smaller one being sometimes placed at the e. end, which is for the sanctus bell, for which reason it is placed over the altar. Municipal belfries are more common on the continent than in this country. When the burghs began to rise into importance after the 12th c., they asserted their rights to have bells to call the burghers together for council or for action. Thus detached belfries arose in the heart of towns. At a later date, they often became part of the *maison de ville*, or town-house, as at Glasgow and Aberdeen, in this country; at St. Quentin and Douai, in France; and at Brussels, in Belgium.

BELFRY, or BEFFROI, a tower of wood, movable on wheels, used in sieges in the middle ages. Sometimes a battering-ram was used with it. It was as high as the wall attacked, and a draw-bridge was rigged at the top to be dropped on the wall when occasion offered.

BELGÆ, the name given by Cæsar to the warlike tribes which in his time occupied that one of the great divisions of Gallia which embraced part of the basin of the Seine, the basin of the Somme, of the Scheldt, of the Maas, and of the Moselle, which itself belongs to the basin of the Rhine. Their country was level, containing no mountains of any height, except the Vosges in the south. The name seems to have originally designated several powerful tribes inhabiting the basin of the Seine, and to have been afterwards used by Cæsar as a general appellation for all the peoples n. of that river. These B. were, in all probability, chiefly of Celtic origin, but within their territories were to be found both pure and mixed Germans.

When s. Britain was invaded by Cæsar, he found that B. from the opposite shores of Gaul had preceded him, and were settled in Kent and Sussex, having driven the aborigines into the interior. The B. in Britain resisted for nearly a century the Roman power, but were finally forced to yield to it. Cæsar regarded them as German, but they rather seem to have belonged to the Celtic portion of the Gallic Belgæ. Certainly, none of the names of their three chief towns are Germanic. Aquæ Solis (Bath) is Latin; Ischalis and Venta (Ilchester and Winchester), British.

BELGARD, a t. in Prussia, 90 m. n.e. from Stettin; has manufactories of tobacco, wool, etc., and a castle; pop. '71, 6303.

BELGAUM', the chief city of a district of the same name in the presidency of Bombay, situated to the e. of the dividing ridge of the West Ghauts, at a height of about 2500 ft. above the sea. Its lat. is 15° 50′ n., and long. 74° 36′ e., its distance to the n.w. of Dharwar being 42 miles. B. possesses a fort, which, in 1818, was taken from the Peishwa by the British. Under its new masters, the place has made considerable progress. It has a superior institution for the education of native youths, which is supported at once by the neighboring princes, the British government, and private individuals. The average annual rain-fall at B. is about 36 inches. In 1848, the citizens spontaneously subscribed a considerable sum for the complete reconstruction of their roads and lanes—a liberality which, besides drawing forth a supplementary grant of public money, roused the emulation of adjacent towns and villages. B. is one of the principal military stations of the presidency, and as such it was, in 1857, the scene of plotting, if not of mutiny, in common with Kolapore, Poonah, Satara, etc. Area of B. district, 4591 sq.m.; pop. '72, 938,750; pop. of town, 26,947.

BELGIC CONFESSION, a statement of faith based on Calvinistic principles, formed by Guido de Bres, of Brabant, and others, about 1561. It was published in the vernacular in 1563, and was received as a symbolical book by the synods of Antwerp and Dort.

BELGIOJO'SO, a t. of Lombardy, n. Italy, pleasantly situated in a fruitful plain between the Po and the Olona, 9 m. e. of Pavia. It has a fine aqueduct and castle, in which Francis I. spent the night previous to the disastrous battle of Pavia, in which he was made prisoner. The Austrian gen. Gyulai made B. his headquarters after his defeat at Magenta, June 4–5, 1859. Pop. 4000.

BEL'GIUM, one of the smaller European states, consists of the southern portion of the former kingdom of the Netherlands (as created by the congress of Vienna).

Geography and Statistics.—Belgium lies between lat. 49° 30′ and 51° 30′ n., and between long. 2° 33′ and 6° 5′ e. It is bounded on the n. by Holland; on the e. by Dutch Limbourg, Luxembourg, and Rhenish Prussia; on the s. and s.w. by France; and on the n.w. by the North sea. Its greatest length, from n.w. to s.e., is 173 English m.; and its greatest breadth, from n. to s., 112 English miles. The whole area is 11,373 sq. miles. The pop. at the census of 1876 was 5,336,185. Beneath are given the provinces, their areas, their pop. in 1873, and their chief towns:

Provinces.	Area in square miles.	Population, Dec. 31, 1873.	Chief cities.
Antwerp	1,094	513,543	Antwerp.
West Flanders	1,250	682,921	Bruges.
East Flanders	1,160	854,366	Ghent.
Hainault	1,436	932,036	Mons.
Liege	1,117	623,165	Liege.
Brabant	1,267	922,468	Brussels.
Limbourg	931	202,922	Hasselt.
Luxembourg	1,705	206,069	Arlon.
Namur	1,413	316,331	Namur.
Total	11,373	5,253,821	

B. is the most densely peopled country in Europe, the pop. being about 462 to the sq.m.; and in the particular provinces of East Flanders, Brabant, Hainault, West Flan-

ders, and Liege, respectively, the proportion is 735, 728, 649, 557, and 555 to the sq. mile. The rural population is to that of the towns as 3 to 1.

Physical Aspect.—B. is, on the whole, a level, and even low-lying country; diversified, however, by hilly districts. In the s.e. a western branch of the Ardennes highlands makes its appearance, separating the basin of the Maas from that of the Moselle, but attains only the moderate elevation of 2000 feet. In Flanders the land becomes so low, that in parts where the natural protection afforded by the downs is deficient, dikes, etc., have been raised to check the encroachments of the sea. In the n.e. part of Antwerp, a naturally unfertile district named the Campine, and composed of marshes and barren heaths, extends in a line parallel with the coast. The once impassable morasses of the *Morini* and the *Menapii*, which stayed the progress of Cæsar's legions, are now drained, and converted into fertile fields, surrounded by dense plantations, which make the land at a distance look like a vast green forest—though, when more closely regarded, we see only numerous dwellings interspersed among fields, canals, and meadows.

Hydrography, Climate, Agriculture, etc.—The abundant water-system of B. is chiefly supplied by the rivers Scheldt and Maas, both of which rise in France, and have their embouchures in Holland. At Antwerp, the Scheldt, which, like the Maas, is navigable all through Belgium, is 32 ft. deep, and about 480 yards wide. Its tributaries are the Lys, Dender, and Rupel. The Maas, or Meuse, receives in its course the waters of the Sambre, the Ourthe, and the Roer. These natural hydrographical advantages are increased by a system of canals which unite Brussels and Louvain with the Rupel, Brussels with Charleroi, Mons with Condé, Ostend with Bruges and Ghent, and this last place with Terneuse. According to the resolution passed by the government in 1842, the long postponed project of cutting canals through the Campine district was at length commenced, and has been very advantageous to the spread of agriculture. A large portion of the Campine seems destined to perpetual barrenness—a dreary, silent, irreclaimable waste; but wherever it has been possible to rescue a patch from the stubborn heath or the relentless sand, there agricultural colonies have been planted, and cornfields shine, and pastures brighten in the heart of the immemorial wilderness. The climate of B., in the plains near the sea, is cool, humid, and somewhat unhealthy; but in the higher s.e. districts, hot summers alternate with very cold winters. April and November are always rainy months. These varieties of climate are favorable to a greater variety of produce than the neighboring country of Holland can supply. The Ardennes districts yield a large supply of wood; while the level provinces raise all kinds of grain—wheat, rye, barley, oats, etc., leguminous plants, hemp, flax, colza, tobacco, hops, dye-plants, and chicory Belgium contains upwards of 7,000,000 acres, of which one half are arable, rather more than one fifth in meadow and pasture, the same in woods and forests, and not above 500,000 acres lying waste. Some hundreds of acres are devoted to vineyards, but the wine produced is of an inferior quality. The forests of Ardennes abound in game and other wild animals. Good pasturage is found on the slopes and in the valleys of the hilly districts, and in the rich meadows of the low provinces. Gardening occupies not less than 130,000 acres; indeed, it has been said that the agriculture of B. is just gardening on a large scale, so carefully and laboriously is every inch of soil cultivated. The spade is still the principal instrument used. In the Campine, the care of bees is very productive, and the cultivation of the silk-worm is encouraged. There are valuable fisheries on the coast, which employ about 200 boats. B. is famous for its horses, and in 1866 contained as many as 283,163 of these animals, 1,242,445 horned cattle, and 686,015 sheep.

Geology.—The geological formations of B. are closely associated with those of France and Britain. The greater portion of the country is covered with *tertiary deposits.* A line drawn across the course of the Scheldt, by Mechlin, along the Demer and Maas, will have on its northern and north-western aspect a tract of tertiary deposits, bounded northwards by the sea. In these tertiary strata the different geological periods are fully represented; but only the second, containing the pleiocene deposits, is rich in fossils. The *secondary deposits* occupy an extensive tract in the center of B., between the Scheldt and the Demer. The most important district, economically, is the south-western, consisting of *palæozoic rocks*—Silurian, Devonian, and carboniferous. These beds have a very complicated structure, from the numerous and extensive flexures and folds they have undergone, and these are often accompanied with great upward shifts, by which beds of many different ages are brought to the same level.

Mineral Products.—B. is rich in minerals, which, next to its abundant agriculture, constitute the chief source of its national prosperity. The four provinces in which they are found are Hainault, Namur, Liege, and Luxemburg. They include lead, copper, zinc, calamine, alum, peat, marble, limestone, slate, iron, and coal. Lead is wrought, but only to a small extent, in Liege; copper in Hainault and Liege; manganese in Liege and Namur; black marble at Dinant; slates at Herbemont; and calamine principally at Liege. But these products are insignificant compared to the superabundance of coal—from anthracite to the richest gas coal—and iron, in which B. ranks next to England. In 1873, B. had 285 coal-mines, employing 107,902 persons, and producing 15,778,401 tons, the total value of which was £13,505,495. In the same year the metallic mines produced about 1,000,000 tons of iron ore, 73,000 of pyrites, 60,000 of calamine, 28,000 of blende, 23,000 of lead, and 450 of manganese. These mines gave employment to

13,122 workmen. In the same year there were 437 iron-works, producing manufactured iron to the value of £10,000,000.

The modern industrial character of the Belgians may be traced back to a very early period, even to the time of the Romans, who noticed the love of traffic prevailing in the Celtic districts of *Gallia Belgica*. This characteristic has remained steadfast to the present time. It is impossible not to recognize in the cloth-weaving *Atrebatæ* the ancestors of the industrious race who gradually extended themselves towards the e. and n. of Belgium. During the early commerce of Europe, when trade was secure only within walled towns, Flanders was the principal seat of productive industry; and its recent separation from Holland has also been indirectly favorable to the development of its internal resources. A state which, like B., begins its career under a burden of debt, which is shut in between nations who possess important ports and colonies, and which is peopled by races not yet sufficiently blended to constitute a perfect nationality, must, before all other things, develop its internal, material resources. This has been well understood in Belgium. Since the commencement of its independent career, it has devoted its attention almost exclusively to those branches of industry and commerce by which its future greatness must be supported.

Manufactures.—The chief manufactures are linen, woolen, cotton, silk, lace, leather, and metals. The great seats of the linen manufacture—recently revived after a long depression—are Courtray and Bruges, in West Flanders; Ghent, in East Flanders; Brussels, in Brabant; Mechlin, or Malines, in Antwerp; and Tournay, in Hainault. The number of linen pieces annually produced is about 900,000. The lawn and damask fabrics of Bruges are celebrated, as well as the lace made in and near Brussels, Malines, Louvain, and Bruges, which sometimes commands a price of £40 per yard. But the Belgian hand-spun yarn, though superior in quality, cannot maintain its ground against machinery. Verviers, Liege, Dolhain, Ypres, Doperinghe, Limburg, Bruges, Mons, Thuin, and Hodimont are centers of the woolen manufacture. Ypres alone employs 50,000 workmen in this branch of industry. Brussels and Tournay have large carpet manufactures, and Hainault supplies a considerable amount of hosiery. The principal manufactures of cotton are at Ghent and Lokeren, in East Flanders; Bruges and Courtray, in West Flanders; Malines, Louvain, and Anderkecht, in Brabant; Tournay and Mons, in Hainault; and also at Antwerp. The separation of B. from Holland had at first a prejudicial effect on this as on other trades; but the opening of the navigation of the Scheldt, the intersection of the country by railways and canals, and, in consequence, the rapid and extensive communication with other countries, have revived the activity of the cotton trade, which now gives employment to between one and two hundred thousand workmen. Maestricht, which belongs to Holland, is one of the chief seats of manufactures of leather; but this trade is also carried on at Limbourg, Liege, Stadelot, Namur, Dinant, and especially at Bruges and Ghent. The manufacture of gloves has made great progress in recent years. Metallurgy also has rapidly increased in productiveness since 1816, when Cockerill introduced into B. the English method of smelting iron with coke. The principal seats of the metal manufacture are Liege, Namur, Charleroi, Mons, and their neighborhoods. There are large ordnance foundries at Liege and Malines, and celebrated makers of fire-arms and machinery in Liege; nail-making at Charleroi; tin-ware, etc., at Liege and in Hainault; wire and brass factories at Namur; zinc manufactures at Liege; lead and shot factories at Ghent: the gold and silver goods of Brussels and Ghent may also be noticed as important branches of Belgian industry. Flax is one of the most extensive and valuable products of B., no fewer than 400,000 persons being employed in its culture and preparation. Besides these, we may mention the straw-bonnet manufacture in the neighborhood of Liege; the paper fabrics of the provinces Liege, Namur, and Brabant; the glass-works of Hainault, Namur, Val-St-Lambert, and Brabant; the porcelain, etc., of Tournay, Brussels, Mons, and Ghent; and sugar-refineries at Antwerp, Bruges, Ostend, Ghent, etc. Steam-engines have been quite familiar objects in the several manufactories of B. for many years.

The natural wealth and industrial resources of B. have always been more or less modified by the political relations of the country. In the middle of the 13th c., B., with Bruges as its chief seat of manufactures, had surpassed all its neighbors in industry, and had established a flourishing commerce with the Italians. After the discovery of America, Antwerp took the place of Bruges, and was regarded as a northern Venice. But the unhappy period of Spanish oppression and the war in the Netherlands deeply depressed Belgian commerce, which suffered still more at the peace of Westphalia, when Holland monopolized the navigation of the Scheldt. The river was again opened at the close of the 18th c., when the French had invaded the Netherlands, and Napoleon caused the harbor of Antwerp to be restored and enlarged. At the cost of Amsterdam, Belgian commerce received a new impulse by the union of B. with Holland, as settled by the congress of Vienna; but scarcely were hopes revived, when the revolution of 1830 changed the prospects of the country. The treaty signed in London, April 19, 1839, gave to Holland the right to levy a toll of two-and-sixpence per ton on all vessels navigating the Scheldt. The privilege of navigation on the inland waters between the Scheldt and the Rhine was purchased by B. for an annual payment of £50,000. In June, 1839, this privilege was virtually taken away by the government of Holland, and, in 1843, with additional expense to B., the new treaty of navigation was ratified by both parties.

During this crisis preceding the development of a free commerce, B. had not neglected her internal resources. The société de commerce de Bruxelles, the banque de Belgique, and other associations for the extension of trade, had been formed; and May 1, 1834, the government adopted the scheme for a railway-system the most complete of any on the continent. The center of the Belgian net-work of railways is Malines, whence lines are carried out in all directions. The n. line goes to Antwerp and its harbor; the w., by Ghent and Bruges, to Ostend; the s.w., by Brussels and Mons, to Quiévrain and the borders of France, not far from Valenciennes; and the e., by Louvain, Tirlemont, Liege, Verviers, and extending to the confines of Prussia. There were in 1874 open for conveyance in B. 2105 m. of railway lines; of these 838 m. were in the hands of the state, and the rest were worked by companies. The cost of the permanent way and buildings of these lines has been about £18,280 a mile. The net revenue at present is stated to be £1508 a mile. The working of the post-office in B. was, in 1874, as follows: Private letters, 58,036,628; official letters, 6,035,861; packets, 30,094,207; newspapers, 58,825,598. On Jan. 1, 1875, there were in that country 479 post-offices, 474 telegraph stations, and the total length of telegraph lines was 3066 m., the length of wires, 12,806 miles. B., along with France, Italy, and Switzerland, entered on a monetary league in 1865, in which the four states agreed to adopt the French decimal system of coins, weights, and measures. In 1873, the imports amounted to £96,992,320, and the exports to £86,556,000. These sums include the value of "goods in transit." Excluding the latter, the value of purely Belgian imports in 1875 was £52,284,120; of exports, £44,072,080. The commercial intercourse of B. with Great Britain, in 1876, amounted to £13,848,293 for exports, and £5,875,407 for imports. Among the principal articles of export are coal, flax, linen, woolen and cotton goods, glass, firearms, and nails More than a third of the whole is consigned to France, and half of the remainder to Germany, England, and Holland. The maritime commerce is chiefly carried on in British ships, the native shipping, which is not increasing, being in 1876 only 59 vessels, of 50,186 tons, with 255 fishing-boats. The unit of the Belgian monetary system is the franc.

The intellectual improvement of B. has not kept equal pace with its material prosperity. The lack of political independence, which has forced the best energies of the country into foreign centers of activity, and the variety and confused mixture of dialects, have retarded the growth of the national intellect, and the formation of national individuality. An independent national literature, acting as the bond of a pure national unanimity, was not possible, under such unfavorable conditions, to which may be added the facilities afforded for supplying the people with cheap reprints of foreign works. The Flemish element—the most important—seems indeed to have become conscious of its capabilities in respect to literature; but a genuine expression of the entire Belgian mind will first become possible when the Walloon element also begins to develop a freer form of speech along with its own peculiar modes of thought. The royal academy of arts and sciences at Brussels is at the head of several other unions for scientific purposes. Among the most celebrated names in Belgian literature and science, may be mentioned—Quetelet in mathematics, Altmeyer the historian, Fetis the musical critic, Conscience the Flemish poet and novelist, Willems the philologist, and Baron and Moke in literary history and criticism. Painting and architecture formerly flourished in the wealthy old towns of Flanders; but after the brilliant epoch of Rubens and his pupils, a long period of dullness followed. In modern times, a revival of art has taken place, as may be proved by the names of the painters, Wappers, De Keyser, Gallait, De Biefve, Verboekhoven, etc.; the sculptors, W. Geefs, Simonis, Jehotte, Fraikin, etc.; the engravers, Calamatta, Brown, and Meunier; and the medalists, Wiener and Hars.

The Belgian school-system suffered for more than ten years under the freedom of teaching allowed by the constitution, which was chiefly made use of by the wealthy Catholic clergy. The consequence was that education assumed a divided and sectarian character. Since the state, however, has exercised a general superintendence over the universities, gymnasia, and elementary schools, a higher style of education has prevailed. The two universities of Ghent and Liege, united with a school of architecture and mining; ten national schools (*Athénées*), in which a classical is combined with a commercial education; upwards of 50 schools preparatory to these (*écoles moyennes*); two seminaries for teachers at Lierre and Nivelle, besides the superintendence now exercised by the state over the institutions formerly maintained by communes and provincial corporations, and, above all, over the primary schools—all this forms a sufficient counterpoise to the numerous schools supported by private individuals and religious bodies. Among the latter may be noticed the Catholic university of Louvain, founded in 1836, and conducted under strict ecclesiastical discipline; the free university of Brussels; and the gymnasia of the Jesuits at Namur, Brugelette, Brussels, and Liege. Journalism in B. has been greatly extended by the abolition of the stamp-duty (1848), and 180 daily newspapers are now published, including 56 Flemish papers; but only a few have obtained a proper degree of respectability and influence.

Population and Religion.—The pop. of B. is of mixed German and Celtic origin. The Flemings (a branch of the Teutonic family) and Walloons (a branch of the Celtic family), distinguished by their peculiar dialects, are still conspicuous among the pure Germans, Dutch, and French. The French language has gained the ascendency in educated society, and in the offices of government; but the Flemish dialect prevails numeri-

cally in the proportion of 4 to 3. The *Catholic religion* is the prevailing form. There are only about 14,000 or 15,000 Protestants, and 3000 Jews. The supreme Catholic dignitaries of B. are the archbishop of Mechlin, and the five diocesan bishops of Bruges, Ghent, Tournay, Namur, and Liege.

The *government* of B. is a limited constitutional monarchy, and was established in its present form by the revolution of 1830. The legislative body consists of two chambers —that of the senate, and that of the representatives. A responsible ministry, with the king as president, is at the head of all public affairs, and its measures are carried into effect by the governors of the several provinces. The ministry includes departments for home affairs, foreign affairs, finance, justice, public works, and war. The administration of justice retains the forms of French jurisprudence. In 1878, the estimated revenue of B. was £10,413,350; and the estimated expenditure, £10,384,230. The national debt amounted in 1878 to 1,521,947,444 francs, or £60,877,897.

The standing army of B. is formed by conscription, to which every healthy man who has passed his nineteenth year is liable. Substitution is allowed. The legal period of service is eight years, but about five years are allowed on furlough. According to a law passed in 1868, the strength of the army is to be 100,000 men on the war footing, and 40,000 in times of peace. The importance of B. in a military point of view affords a reason for the maintenance of fortifications at Antwerp, Ostend, Nieuport, Ypres, Tournay, Mons, and other places.

History of Belgium to 1830.—In the time of the Romans, the name *Gallia Belgica* was given to the southern Netherlands lying on the confines of Gaul and Germany. It was peopled by Celtic and German tribes. The latter were predominant in Batavia and Friesland, and under the rule of the Franks in the 5th and 6th c., gained the ascendency also in the southern districts. Until the close of the 11th c., the feudal system, which arose at the fall of the Carlovingian dynasty, prevailed in the Netherlands, where the several southern provinces were made duchies and counties. The co. of Flanders, superior to all the others in industry and commerce, maintained, during a long struggle, its independence against France; and, in 1385, when the male line of the counts of Flanders expired, was annexed to the powerful house of Burgundy, which, in the beginning of the 15th c., also gained possession of all the other provinces of the Netherlands. The rulers of Burgundy aimed at founding a powerful united state between France and Germany, and therefore endeavored to repress the free republican spirit which manifested itself in the rapidly rising towns. The work of establishing unlimited sovereignty was interrupted by the fall of Charles the bold, and the partial division of his territories; but was continued by the emperor Charles V., the grandson of the emperor Maximilian, and Maria, the heiress of Burgundy—through the latter of whom the Netherlands passed into the possession of the house of Hapsburg. After the abdication of Charles, these provinces passed into the hands of Philip II., and by the law of primogeniture, should have remained united with Spain. But scarcely had the peace of Château-Cambresis (1559) put an end to the encroachments of France, when the religious disputes of the reformation, and the despotic measures of Philip, excited in the provinces a long and bloody war for civil and religious freedom, which ended in the independence of the northern or Teutonic Netherlands, while in the southern or more Celtic provinces (now included under B.), both the sovereignty of Spain and the rule of the Roman Catholic church continued. In 1598, B. was ceded by Philip II. to his daughter Isabella, wife of the archduke Albert, when it became a distinct and independent kingdom. Several measures for the better regulation of internal affairs, especially in the administration of justice, and for the revival of industry, which had been injured by the unenlightened policy of Philip, were projected. Unfortunately, Albert died childless in 1621, and B. fell back into the hands of Spain, and became involved in the wars attending the decline of the Spanish monarchy. Peace was concluded chiefly at the cost of Belgium. By the treaty of the Pyrenees (1659), the counties of Artois, Thionville, and other districts, were given to France. Subsequent conquests by the same powerful neighbor secured to it, at the peace of Aix-la-Chapelle (1668), the possession of Lille, Charleroi, Oudenarde, Courtray, and other places. These were partly restored to B. at the peace of Nimeguen; but as a compensation, Valenciennes, Nieuport, Cambray, St. Omer, Charlemont, and other places, were given up, and only partially regained by B. at the peace of Ryswick in 1697. After the conclusion of this treaty, at the close of the reign of Charles II. of Spain, some endeavors were made to create prosperity in B. by a new system of taxation and customs, and by the construction of canals, to counteract the injury done to its commerce by the closing of the navigation of the Scheldt; but these projected improvements were interrupted by the Spanish war of succession, which was not concluded until the peace of Utrecht, in 1713. By this treaty, B. was given to Austria, Holland retaining the privilege of garrisoning the most important fortresses on the French frontier, and also of exercising a monopoly of the navigation of the Scheldt. The "Belgian commercial company" at Ostend, founded by Charles VI. in 1722, fell in 1731—another sacrifice to the cupidity of Holland. During the Austrian war of succession (1744), almost the whole country fell into the hands of the French; but was peaceably restored to Austria by the treaty of Aix-la-Chapelle (1748).

B. remained undisturbed by the seven years' war, and during the long peace following the treaty of Aix-la-Chapelle, prosperity was restored. Especially during the

mild reign of Maria Theresa of Austria, measures of public improvement were promoted by prince Charles of Lorraine, governor of the Belgian provinces. The reign of Joseph II., son and successor of Maria Theresa, began in disputes with Holland. The latter country consented to the abolition of the *barrière-contract*, in consequence of which, several important fortresses were demolished, though the emperor failed in his endeavor to make free the navigation of the Scheldt. But the errors of his internal administration were the serious feature of his policy. By his innovations, he offended the religious sympathies of the people, and violated the legal privileges of the states, of which he had made the strict preservation a condition of obedience. In a short time, discontent openly manifested itself. The Austrian authorities were attacked; Brabant refused to pay taxes; while the more violent fled into Holland, and organized an armed expedition. Returning, they were joined by numbers of the inhabitants, defeated the foreign troops, captured Brussels, and, in the beginning of 1790, declared their independence. In the course of the year, however, the Austrians succeeded in regaining possession of the country. The privileges of the states as they existed at the close of the reign of Maria Theresa were restored, and at the same time stringent measures were adopted to prevent any renewal of disturbances. But this state of peace was soon interrupted by the outbreak of the war of the French revolution. B. was conquered by Pichegru in the campaign of 1794, and subsequently united to France by the treaties of Campo-Formio and Luneville. It now shared in the fortunes of France during the consulate and the empire; received the *code Napoleon;* and in all political relations was organized as a part of France. After the fall of Napoleon, it was united with Holland, and its boundaries defined by the congress of Vienna (May 31, 1815).

At the introduction of the new constitution, the want of national unity in language, faith, and manners was strikingly manifested by the two great parties—the Dutch Protestant population, with their commercial habits, on the one side, and the Catholic population, of agricultural and manufacturing B., on the other. These natural and unavoidable obstacles to the political harmony of the new kingdom, were further increased by the unfair treatment which B. experienced. All the more important provisions of the constitution had a regard chiefly to the interests of Holland. Repeated attempts were made to supersede the Belgian language by the Dutch in all affairs of administration and jurisprudence, though the former were the more numerous people; the privileges of the Belgian clergy were abridged; the poorer classes were severely taxed; while the government was almost exclusively composed of Dutchmen. In 1830, among seven ministers, there was only *one* Belgian; among 117 functionaries of the ministry of the interior, only 11 Belgians; among 102 subordinates of the ministry at war, only 3 Belgians; and among 1573 officers of infantry, only 274 Belgians. B. was politically divided into two classes —the Liberal and the Catholic. Both of these strongly resented and opposed the encroachments of Holland: the Liberals, from a desire to preserve the national secular institutions; the Catholics, from a desire to preserve the national church. The government became alarmed at their increasing hostility; and ultimately, when their patriotic fusion rendered its position critical, it made several concessions; the supremacy of the Dutch language, and the taxes on the necessaries of life, were abolished. Efforts were also made to conciliate the Catholic priesthood. But these concessions came too late, and were, in consequence, only construed as signs of weakness. In 1828 and 1829, it was attempted to coerce and intimidate the opposition, by prosecuting the liberal or democratic leaders. This only fanned the fire of discontent, which was already burning fiercely in the hearts of the Belgians, and panting for an opportunity to break out into visible insurrection.

From 1830 *to the present time.*—The French revolution of 1830 afforded the desired occasion. On the king's birthday (Aug. 24, 1830), several riots occurred in various towns of Belgium. At this period, however, the idea of separation from Holland does not seem to have presented itself consciously to the Belgian mind; the deputies who were sent to the Hague to state the causes of the general dissatisfaction, merely insisted on its possessing a separate administration, with the redress of particular grievances. But the dilatory and obstructive conduct of the Dutch deputies in the states-general assembly at the Hague on the 13th Sept., exasperated the Belgian nation beyond measure. A new and more resolute insurrection immediately took place. In seven days, the people had deposed the old authorities, and appointed a provisional government. Prince Frederick, the son of the sovereign, who commanded his father's troops, was compelled to retreat from Brussels to Antwerp, having suffered considerable loss. On the 4th Oct. B. was declared independent by the provisional government, composed of Messieurs Rogier, D'Hooghvorst (commandant of the civic guard), Joly, an officer of engineers, and the secretaries Vanderlinden and De Coppin; count Felix de Mérode, Gendebien, Van de Meyer, Nicolai, and De Potter, the democratic leader. They also announced that a sketch of the new constitution was in course of preparation, and that a national congress of 200 deputies would shortly be called together. Freedom of education, of the press, of religious worship, etc., were proclaimed. Here and there, the new liberty showed a tendency to become anarchic; but its excesses were speedily suppressed; and at the national congress of the 10th Nov., out of 187 votes, only 13 were in favor of a democratic government. Meanwhile, the London congress had assembled, and after mature deliberation, recognized the severance of the two kingdoms as a *fait accompli* (Dec.

10). The Belgian congress, on its assembly, appointed baron Surlet de Chokier provisional regent, but on the 9th July elected prince Leopold of Saxe-Coburg king, who entered Brussels on the 21st of the same month, and subscribed the laws of the constitution. This prince proved himself one of the wisest monarchs of modern times. He died in 1865, and was succeeded by his son, Leopold II., the present king of Belgium. Holland refused to acknowledge the validity of the decision of the London congress, and declared war against B., which was speedily terminated by France and England—Holland securing that B. should annually pay 8,400,000 guilders as interest for its share in the national debt of Holland. The latter country, however, was still dissatisfied, and ventured to employ force. England and France were compelled to interfere. The blockade of the coast of Holland brought the Dutch to terms, and the dispute was closed by a treaty signed in London, May 21, 1833.

The monarchy of B. is hereditary, according to the law of primogeniture, but with a perpetual exclusion of females and their descendants. The legislative power is vested in the king and two chambers; and the king has the power to dissolve either the senate or the house of representatives, or both. The number of deputies in 1869 was 116, sent by 41 electoral districts. Electors must be Belgians by birth or naturalization, must have attained 25 years of age, and pay taxes, each to the amount of £1 13*s.* 4*d.* Members of the chamber of representatives require no property qualification. The senate consists of half the number of representatives, and is elected by the same constituency, but for 8 years instead of 4. A senator must be 40 years of age, and must pay at least 1000 florins of direct taxes. The budget is annually voted by the chambers, and the contingent of the army is also subject to their annual vote.

In 1842, a law was carried in both chambers, by which it was enacted that the parishioners should be bound to provide elementary schools, according to the wants of the population, in all places where the want of education was not fully supplied by voluntary means. The main regulations for the universities were effected by the ministry of De Theux, 1835; but the organization of intermediate instruction (that is, between the *ecoles primaries* and the universities) was postponed, as involving some delicate party interests, until 1850; and even then was not concluded in a way satisfactory to the Catholic clergy.

In 1838, it seemed as if Holland and B. were likely to engage in war once more. According to the "twenty-four articles" of the "definitive treaty," B. was under obligation to give up Limburg and a part of Luxemburg during the above-mentioned year. This it now refused to do, and put its army on a war-footing; but its obstinacy finally gave way to the unanimous decision of the five great powers.

After 1840, the opposition of the Catholic to the liberal party became more and more decided. The elections of June 8, 1841, were attended with great excitement, and it was a significant fact that the liberal candidates re-elected were everywhere returned by large majorities, while in the principal towns where Catholics were returned, only small majorities appeared. Meantime, however, commerce progressed under a wise and liberal policy.

In July, 1845, the liberal Van de Weyer, at the head of a new administration, endeavored to confirm the so-called "union" of Catholics and liberals. But he had scarcely asserted the prerogative of the civil power in matters pertaining to the question of education in the "intermediate schools," when he was forsaken by his colleagues, who acted under the influence of the Catholic priesthood. In Mar., 1846, a purely Catholic ministry was formed under the presidency of De Theux. This was an anachronism, for the elections of 1845 had secured a victory for the liberals.

The elections of 1847 at last brought to a close the system of government in subservience to the church. A new liberal ministry was formed by Rogier and others, whose programme of policy promised the maintenance of the independent civil authority in all its subordinate functionaries; a budget favorable to the public with regard to duties on provisions; and measures to promote the interests of agriculture. The institution of numerous agricultural and commercial schools, normal *ateliers*, popular libraries, and other means used for raising the working-classes, were followed by most beneficial results. The revolutionary tempest of 1848, however, menaced the tranquillity of the country; but the king, at the outbreak of the catastrophe in France, promptly declared himself ready to retain or to surrender the crown of B., according to the decision of the people. This frank and ready declaration had a successful result in strengthening the party of order, while it disarmed even those most disaffected to the crown.

In July, 1848, the result of the elections was found to be a great strengthening of the liberal-constitutional party. In Nov., 1849, a new commercial treaty for 10 years was concluded with France, and the duration of the treaty with the German zollverein was lengthened. In 1850, the educational question was supposed to be settled on soundly liberal principles; but since then there has been a keen struggle between the progressists and the ultramontanes. At present the question of liberal advance in education and religion in B. is, as it is in Prussia, France, and Italy, a question of very considerable interest.

Nothomb's *Travaux Publics en Belgium* (Bruss. 1839); *Statistique de la B.*, by the same author (1848); Juste, *Histoire de B.* (5th ed., 1868); Popliment, *La B. depuis l'an* 1830 (Bruss. 1850).

BELGOROD (Russian, *Bejelgorod*, "white town"), a t. of (1867) 15,200 inhabitants, in the Russian government of Kursk. It is situated on the Donetz, in lat. 50° 40′ n., long. 36° 35′ east. B., which derives its name from a chalk-hill in the vicinity, is divided into two—the old and the new towns. It is built chiefly of wood, is an archbishop's see, has numerous churches, two monasteries, manufactories of leather, soap, etc., and carries on a considerable trade in wax, bristles, and hemp. Three important fairs are held here during the year.

BELGRADE', the ancient *Singidunum*, styled by the Turks *Darol-Jihad*, the "house of the holy war," and in German, *Weissenburg*, is an important fortified and commercial t., capital of Servia. It is situated at the confluence of the rivers Save and Danube. The name B. is derived from the Slavonic word *bielo*, "white," and *grad* or *grod*, a "fort" or "town." B. contains (1874) 27,605 inhabitants, and is divided into four parts—the fortress, a very strong place, which, situated on the tongue of land between the rivers, commands the Danube; the Water town, also well protected by walls and ditches, on the n.; the Raitzen town on the w.; and the Palanka on the s. and e. of the citadel. B. contains 14 mosques. The prince's palace, the residence of the metropolitan, the national theatre, and the public offices are the principal buildings. Vessels navigating the Danube anchor between the three islands above Belgrade. B. has manufactories of arms, cutlery, saddlery, silk goods, carpets, etc., and is the seat of the chief Servian authorities. It is the entrepôt of the trade between Turkey and Austria. The position of B. has made it the chief point of communication between Constantinople and Vienna, and the key to Hungary on the s.e. It has consequently been the scene of many hard contests. The Greeks held it until 1073, when it was captured by the Hungarian king, Salomon. After this, it passed through the hands of Greeks, Bulgarians, Bosnians, and Servians, and these last proprietors sold it, in the beginning of the 15th c., to the emperor Sigismund. In 1442, it was unsuccessfully besieged by the Turks, with a large and vain outlay of time and money; and when stormed (July 14, 1456), it was retaken from the Turks by the heroism of Hunyades and Capistrano. In 1522, it was carried by the sultan Soliman II. In 1688, it was stormed and taken by Maximilian, elector of Bavaria; but in 1690 was recaptured by the Turks, when the Christian garrison had been reduced to 500 men. In 1693, B. was vainly besieged by the duke of Croy; and in 1717, the citadel surrendered to prince Eugene, after he had defeated an army of 200,000 Turks, with a loss to them of 20,000 men. But in 1739, B. again changed owners, the Turks obtaining it without a shot. In conformity with the treaty then signed, the fortifications were demolished. In 1789, it was again taken by the Austrians under gen. Laudon; but by the treaty of peace, 1791, was restored to the Turks. From 1806 to 1813 it was in the possession of the insurgent Servians; and though on the founding of the principality of Servia, B. was made the capital, the citadel remained in the hands of the Turks till 1867. In that year the porte was constrained by diplomacy to yield up this important possession to the Servian government.

BE'LIAL, or, more accurately, BELI'AL, a Hebrew word, signifying idle, wicked, or unprofitable. The Scripture phrase, therefore, "sons of B.," was originally, in all probability, a mere Hebrew figurative expression denoting worthless or dissolute persons. At a later period, the idea of evil which the word embodies, seems to have been elaborated into a personality, and B. is supposed by some to correspond to the Pluto of the Greeks.

BELIDOR, BERNARD FOREST DE, 1693–1761; a French military engineer, and a member of the academy of sciences; author of works on hydraulic architecture, fortifications, engineering, mathematics for the use of artillery, etc.

BELIEF. This is a word sufficiently intelligible in common speech; but, nevertheless, various subtle problems and protracted controversies have been connected with it. A brief account of the chief of these may be here given.

1. It has been a matter of no small difficulty with mental philosophers, to give an exact rendering of the state of mind so denominated, or to specify the exact import, test, or criterion of the act of believing. It is easy enough to comprehend what is meant by an idea or a notion, as when we speak of having the idea of a rose, its shape, color, odor, etc.; but when we make the further step of affirming our belief in the sweetness of the rose, it is not so easy to describe the exact change that has come over the mind in so doing. In all belief, there must be something intellectual, something thought of, or conceived by the mind; and hence there has been a disposition to recognize the believing function as one of the properties of our *intelligence*. We believe that the sun will rise and the tides flow to-morrow: here are undoubtedly implied intellectual conceptions of the sun, his rising, and of to-morrow; of the sea, its movements, and so on. But the question comes, what is the difference between conceptions believed in as these are, and conceptions quite as clear and intelligible that are not believed? as the notion that the fluctuation of the sea on the shores of Britain is the same as on the shores of Italy. It is not to the purpose to say, that in the one case we have knowledge and evidence, and not in the other; for what is wanted is to define the change that comes over us, when what is a mere notion or supposition passes into a conviction; when a day-dream or hypothesis comes to take rank as truth.

To answer this inquiry, we must bring in a reference to *action;* for although belief connects itself with our intelligence, as now mentioned, it has action for its root and ultimate criterion. Coming up to the edge of a frozen lake, and looking at the thickness of the ice, we believe that it will bear to be trodden on, and accordingly walk across it. The meaning or purport of the believing state here is, that we do not hesitate to trust our safety to the fact believed. The measure of our confidence is the measure of our readiness to act upon our conviction. If the frozen lake lie between us and our destination, we feel elated by the certainty of arriving there, which we should not under a weak or imperfect trust in the goodness of the ice. Belief, therefore, although embodied in ideas, or intellectual conceptions, is in reality a moral power, operating on our conduct, and affecting our happiness or misery. Belief in coming good cheers us almost as much as if it were already come; a like strength of conviction of approaching evil is to the same degree depressing; "the devils believe, and tremble." These two tests—readiness to act according to what we believe, and influence on the mental tone—effectually separate the state in question from mere notions, fancies, or suppositions, unaccompanied with credence. We have firm confidence in the food we eat being able to nourish us; we exert ourselves to procure that food, and when we feel hungry, and see it before us, we have the mental elation arising from a near and certain prospect of relief and gratification. If there be anything that we work languidly to procure, and feel little elated by being near or possessing, our conviction is proved to be feeble as to the utility of that thing, or as to the pleasure we shall derive from it. So, in employing means to compass ends, as when we sow that we may reap, work that we may obtain abundance, study that we may be informed—we have a certain confidence in the connection between the means and the ends; in other words, we are energetically urged to use those means, and having done so, we have the feeling as if the end were already attained.

Even in cases the furthest removed in appearance from any action of ours, there is no other criterion. We believe a great many truths respecting the world, in the shape of general propositions, scientific statements, affirmations on testimony, etc., which are so much beyond our own little sphere, that we can rarely have any occasion to involve them in our own procedure, or to feel any hopeful elation on their account. We likewise give credit to innumerable events of past history, although the greater number of them have never any consequences as regards ourselves. Yet, notwithstanding such remoteness of interest, the tests now mentioned must apply; otherwise, there is no real conviction in any one instance.

There is a distinction, first characterized by Aristotle, between potentiality and actuality (*posse* and *esse*), which truly represents two different states of mind of real occurrence. Besides the actual doing of a thing, we know what it is to be in a state of *preparedness* to act, before the emergency has arisen, or while it is still at a distance and uncertain. The thirsty traveler, not knowing of a spring where he may drink, is debarred from the act that his condition prompts him to, but he is in an attitude of mind that we call being ready for action the moment the opportunity arrives. We all carry about us a number of unexecuted resolutions, some of them perhaps remaining so to the last, for want of the occasion. They are not, on that account, to be set aside as having no part in our nature; they are genuine phases of our activity. So it is with many things believed in by us, without any actual prospect of grounding actions, or staking our welfare, upon such things. When we say we believe that the circumference of the globe is 25,000 m., if not repeating an empty sound, or indulging an idle conception, we give it out that if any occasion arise for acting on this fact, we are ready to do so. If we were about to circumnavigate the earth, we should commit ourselves to this reckoning. Should there be any hesitation on the point when the time for action came, the professed belief would be shown to be hollow, no matter how often we heard the statement, or repeated it, with acquiescence. The genuineness of conviction is notoriously open to question, until an opportunity of proceeding upon it occurs. Very often we deceive ourselves and others on the point—whether we are in full potentiality or preparedness in some matter of truth or falsehood. There is a very large amount of blind acquiescence in, or tacit acceptance of, propositions which never become the subject of any real or practical stake. These beliefs falsely so called confuse the line of demarkation between mere intellectual notions and states of credence or conviction. Of this nature is the acceptance given by the mass of mankind to the statements they are accustomed to hear from the better informed class respecting the facts of science and the transactions of history. They do not dispute those statements; and yet they might be little disposed to commit their serious interests to such facts. So with regard to the religious creed handed down from parent to child. Some are found believing, in the full import of the term; others, opposing no negative in any way, yet never perform any actions, or entertain either hopes or fears, as a consequence of their supposed acceptance of the religion of their fathers; their belief, accordingly, must be set down as a nonentity.

2. There is considerable interest attached to the inquiry into the *sources* or operating causes of this efficacious attribute of our active nature. What are the influences that determine us to adopt some notions as grounds of action and elements of hope or depression, in preference to others? The common answer to this question is the possession of evidence, of which two kinds are reckoned by some schools—namely, experience and

intuition; while others recognize experience alone, and reject the intuitive as a sufficient foundation of belief.

As regards the actual sources of men's convictions, it is undeniable that many things are credited without any reference to experience. The existence of superstitions is an example. So the partialities arising out of our likings to particular persons, and the undue depreciation of the merits of those whom we dislike, present instances equally removed from the criterion of experience. It is evident, therefore, that men do not abide by that criterion, even granting that they ought to do so. Accordingly, it is one of the tasks of the mental philosopher to specify the portions of our constitution that give birth to false, mistaken, or unfounded beliefs; and in so doing he indicates, first, certain intuitive impulses connected with our active nature; and secondly, our various feelings, or emotions. Whether the intuitive be a source of authentic beliefs, may be a matter of doubt; there is no doubt as to its being a genuine source of real convictions. We have a decided tendency from the first to believe that the present state of things will continue, and that the absent resembles the present. He that has always seen water liquid, cannot at first be convinced that it is ever or anywhere solid. We have always a great difficulty in surmounting the primitive impulse to consider other men's minds as exactly like our own. It is the tendency of the uncultured human being to overgeneralize; and experience comes as a corrective, often very painful to submit to. Then, again, as regards the emotions, it is found that every one of these, if at all strong, is liable to blind us to the realities of the world. Fear is a notable example. Under a fright, a man will believe in the approach of the direst calamities. Superstition is, for the most part, the offspring of men's fears. The effect of a strong emotion is to exclude from the mind every fact or consideration except those in keeping with itself. Intense vanity so lords it over the current of the thoughts and the course of the observations, as to present to one's mind only the very best side of the character. A fit of self-abasement and remorse will work the contrary effect.

It is plain enough, therefore, that we are very often in the wrong, by trusting to our intuitive tendencies, and as often so under our emotions; while we are as ready to act, and to derive comfort or the opposite, under false beliefs, as under the very soundest that we can ever arrive at. The practice of life points to *experience* as the check to wrong believing. If we find on trial that another man's feelings differ very much from ours in the same circumstances, we stand corrected, and are perhaps wiser in future. So, in science, experiment is the ultimate canon of truth. There prevails, notwithstanding, in one school of philosophy, comprising the majority of metaphysical philosophers both in England and in Germany and France, the opinion that experience is not the only source even of *sound* or true beliefs. There are those who contend for an *à priori* origin of scientific first principles; such, for example, as the axioms of mathematics. "Things that are equal to the same thing are equal to one another," is one of the class about which this dispute reigns. There is also a doctrine current that the law of causation has an authority derived from intuition. Another class of beliefs relates to matters altogether beyond experience; such is the metaphysical doctrine of the infinite. These various convictions—*à priori*, as they are called, being grounded solely in the internal impulses of the human mind—are all open to one common remark. It must be conceded that some intuitive beliefs are unsound, seeing that we are obliged to reject a greater or less number because of their being flatly contradicted by our experience. But if any have to be rejected in this way, why may not all be; and what criterion, apart from experience, can be set up for discriminating those that we are to retain? Man undoubtedly has boundless longings; and the doctrine of the infinite corresponds in a manner to these. But in actual life we find very few of our desires fully gratified, not even those most honorable to the human mind, such as curiosity, the passion for self-improvement, and the desire of doing good. How, then, are we to ascertain which of the longings carries with it its own necessary fulfillment? Moreover, the intuitive tendencies are exceedingly various in men; and all cannot be equally true.

Testimony, which is properly reckoned one of the sources of belief, is, in its operation, partly founded on an intuitive tendency, and partly on experience. We at first believe whatever we are told; the primitive phase of our nature is credulity; the experience that we soon attain to of untrue statements puts us on our guard, and we learn to receive testimony under some circumstances, and from some persons, and not in all cases indiscriminately.

3. *Responsibility for Belief.*—A lengthened controversy arose some time ago, on the saying of Lord Brougham, that "man is no longer accountable to man for his belief, over which he has himself no control." Reduced to precise terms, the meaning of this assertion is: a man's belief being involuntary, he is not punishable for it. The question therefore arises, *how far* is belief a voluntary function? for it is known that the will does to some extent influence it.

What a man shall see when he opens his eyes is not in his own power; but the opening of the eyes is a voluntary act. So, after listening to a train of arguments on a certain dispute, we might be irresistibly inclined to one side; but, supposing us to live in a country where the adhesion to that side is criminal, and punished severely, we should very likely be deterred from hearing or reading anything in its favor. To this extent, the adoption of a belief is voluntary. The application of strong motives of the nature

of reward or punishment is sufficient to cause one creed to prevail rather than another, as we see in those countries and in those ages where there has been no toleration of dissent from the established religion. The mass of the people have been in this way so fenced in from knowing any other opinions, that they have become conscientiously attached to the creed of their education.

When the question is asked, therefore, whether punishment can control men's beliefs, and not their professions merely, all history answers in the affirmative, as regards religious and political creeds, on which the majority of mankind, being insufficient judges of themselves, are led by tradition and by education. But in matters of daily practice, where the simplest can judge as well as the wisest, the case is altered. No severity of threat could bring a man into the state of believing that his night's rest was hurtful to him; he might be overawed into saying that it was so, but he would never act out his forced affirmation, and therefore he would show that he did not believe it.

If the sentence of Lord Brougham is held to imply that all beliefs are beyond the power of external motives, and therefore that rewards and punishments can go no further than making outward conformity, we must pronounce it erroneous. For granting that motives cannot have a direct efficacy on the state of a man's convictions—which cannot be conceded in all cases—yet the *indirect* influence is so great as to produce the unanimity of whole nations for centuries in some one creed. But if it is only meant, that such indirect means *ought not* to be applied to sway men's convictions, this is merely a way of affirming the right of free thought and inquiry to all mankind, and the iniquity of employing force on such a matter.—On the subject of belief generally, see Bain on the Emotions and the Will.

BELISA'RIUS (in Slavonic, *Beli-tzar*, "White Prince"). This heroic and loyal soldier, to whom the emperor Justinian was principally indebted for the glory of his reign, was born at Germania, in Illyria, about 505 A.D. He first assumed a conspicuous position when he was appointed to the command of the eastern army of the empire, stationed on the confines of Persia, where, in 530 A.D., he gained a victory over a Persian army nearly twice as large as his own. The historian Procopius was at this time secretary to Belisarius. In the following year, when the Persians had penetrated into Syria, intending to attack Antioch, B. being compelled by the impatience of his troops to offer battle at Callinicum, a town at the junction of the rivers Bilecha and Euphrates, was defeated, and in consequence recalled. This petulant injustice, however, did not weaken that principle of duty which ever controlled and inspired the great soldier. He still remained the firm supporter of his sovereign. In Constantinople, the strife of the two parties, styled respectively "the green" and "the blue," had endangered the authority and even the life of Justinian; already a new emperor, Hypatius, had been elected, when B., at the head of the life-guards, attacked and slew, in the race-course, 30,000 of the green or anti-loyalist party, and thus restored tranquillity. Previous to this, he had married a wealthy but profligate lady, Antonia, whom he loved with the same blind uxoriousness that Marcus Aurelius exhibited towards Faustina. The only points in his history which are not edifying, are those in which he yielded to her noxious solicitations. The military career of B. may be divided into two great epochs; the war against the Vandals in Africa, and the war against the Goths in Italy, which again subdivides itself into two campaigns, with an interval of four years between them. The first of these epochs was commenced by Justinian sending B., in 533 A.D., with an army of 15,000 men into Africa, in order to recover the provinces there held by the Vandal king, Gelimer. After achieving two victories, B. made the king a prisoner, seized his treasures, and after conquering Sardinia, Corsica, and the Balearic Isles, he brought him to Constantinople, where he appeared in a triumphal procession of the conqueror—the first that a subject had enjoyed since the days of Tiberius. The African Vandals never recovered from this overthrow. Medals were struck in B.'s honor; and on the 1st Jan., 535, he was invested with the dignity of "consul," and granted a second triumph, according to the old republican style. The second war was occasioned by the divisions existing in the royal family of the Ostrogoths, which induced Justinian to attempt to wrest Italy from the hands of the barbarians. In 535, B. conquered Sicily; and in the autumn of 536, he crossed over to lower Italy, where all the cities submitted to him except Naples, which he carried by storm. On the 10th of Dec. he entered Rome, having made an amicable arrangement with the inhabitants. As he found his forces not strong enough to contend with the Goths in open field, he allowed himself to be inclosed and besieged in Rome: after the defense had lasted a year, the Goths raised the siege. In 538, Narses had been sent with a reinforcement for the army in Italy; but some misunderstanding occurring between the two generals, they were prevented from relieving Milan, which in 539 was carried and devastated by Braias, nephew of the Gothic king, Vitiges. Consequently, Narses was recalled from Italy; and B., now placed at the head of both armies, refused to assent to a treaty proposed to king Vitiges by Justinian's ambassadors. Vitiges had persuaded the Persian king, Chosroes, to invade the eastern Roman territory. B. now drove the Goths back to Ravenna, which he captured in 540, along with Vitiges himself. But before he could complete his conquest of the Goths, he was recalled by Justinian to Constantinople, where he soon appeared, bringing with him the king Vitiges, several Gothic chieftains, and the royal

treasures. In 541–42, he was engaged in a campaign against the Persians, who had captured Antioch; but was again recalled, on account of slanderous representations made to the emperor, and the enterprise necessarily proved indecisive. His second great struggle with the Ostrogoths now begins. In 544, the barbarians, under Totila, again invaded and reconquered Italy. B. was sent against them, but with an insufficient army. He, however, maintained his ground for five years, harassing the enemy by his skillful movements, and even succeeded so far as to regain possession of Rome. But, in spite of his repeated entreaties, no reinforcements were sent to him; and in Sept., 548, he gave up the command, his rival, Narses, being appointed in his place. After ten years of retirement, B. once more came forward at the head of an army hastily collected, and overthrew the Bulgarians, who had threatened Constantinople. Here this faithful servant, who at Ravenna had, in a spirit of noble loyalty unknown to the warriors in those selfish and ambitious times, refused the crown of Italy offered to him by the Goths, was at length accused of a conspiracy against Justinian, and imprisoned, Dec., 563; but according to Malala and Theophanes, Justinian became convinced of B.'s innocence, and restored him, after six months, to all his honors. He died Mar., 564.

The biography of B. has been treated with great license by writers of fiction, especially by Marmontel, who has represented the hero as cruelly deprived of sight, and reduced to beg for his bread in the streets of Constantinople. Tzetzes, a writer of the 12th c., states that, during his half-year's imprisonment, B. suspended a bag from the window of his cell, and exclaimed to those who passed by: "Give an obolus to B., who rose by merit, and was cast down by envy!" but no writer contemporary with B. mentions this circumstance. Lord Mahon, in his *Life of Belisarius* (Lond. 1829), endeavors, but without success, to confirm the tradition, or rather the fiction, of B. being deprived of sight and reduced to mendicancy. This fiction supplies the subject of a fine picture by the French painter Gérard.

In figure, B. was tall and majestic; in disposition, humane and generous; pure in his morals, temperate in his habits, a valiant soldier, a skillful general, and above all, possessed by a sublime spirit of loyalty to his sovereign.

BELIZE. See BALIZE.

BELJU'RIE, or BAILJURIE, a t. of India, in the British district of Moradabad, n.w. provinces, 2 m. n.w. from Kashipur. Pop. '71, including part of Kashipur, 8253.

BELKNAP, a co. in New Hampshire; intersected by the Boston, Concord and Montreal railroad; 360 sq.m.; pop. '80, 17,948. The surface is hilly, soil fertile. Co. seat, Laconia.

BELKNAP, JEREMY, D.D., 1744–98; b. Mass., and graduate of Harvard; pastor in New Hampshire, and over Federal street church, Boston. He founded the Massachusetts historical society in 1791. Among his works are *History of New Hampshire*, and *American Biography*.

BELL. Bells are usually formed of a composition of copper and tin, called bell-metal. When the proper proportions of the two metals are fused together, the compound is poured into a mold. Authorities differ as to the best proportions of the copper and tin. Some give 80 parts of copper to 20 of tin, or 4 to 1; others state the proportions as being 3 to 1. In the reign of Henry III. of England, it would seem to have been 2 to 1; and the small bronze bells discovered by Mr. Layard in the palace of Nimroud, are found to contain 10 of copper to 1 of tin. Hand-bells are often made of brass, antimony alloyed with tin, German silver, real silver, and gold. The notion that in old times silver was mixed with bell-metal to sweeten the tone, is a mistake. Silver, in any quantity, would injure the tone. The quality of a bell depends not only on the composition of the metal it is made of, but very much also on its shape, and on the proportions between its height, width, and thickness; for which the bell-founder has rules derived from experience, and confirmed by science. The pitch of a bell is higher the smaller it is. For a peal of four bells to give the pure chord of ground tone (key-note), third, fifth, and octave, the diameters require to be as 30, 24, 20, 15, and the weights as 80, 41, 24, 10. A less quantity of metal than is due to the caliber of the bell though giving the same note, produces a meager harsh sound; and the real or fancied superiority in dignity of tone of some old bells, is ascribed to a greater weight of metal having been allowed for the same note than modern economy would dictate. Bells have been cast of steel, some of which have had a tone nearly equal in fineness to that of the best bell-metal, but deficient in length, having less vibration. Some have also been cast of glass, with a considerable thickness of the material; and these give an extremely fine sound, but are too brittle to stand the continued use of a clapper.

From a remote antiquity, cymbals and hand-bells were used in religious ceremonies. In Egypt, it is certain that the feast of Osiris was announced by ringing bells; Aaron, and other Jewish high-priests, wore golden bells attached to their vestments; and in Athens, the priests of Cybele used bells in their rites. The Greeks employed them (*koda*) in camps and garrison; and the Romans announced the hour of bathing and of business by the *tintinnabulum*. The introduction of bells into Christian churches is usually ascribed to Paulinus, bishop of Nola in Campania (400 A.D.); but there is no evidence of their existence for a century later. That they were first made in Campania, is

inferred from the name given to them—*campanæ;* hence *campanile*, the bell-tower. Their use in churches and monasteries soon spread through Christendom. They were introduced into France about 550; and Benedict, abbot of Wearmouth, brought one from Italy for his church about 680. Pope Sabinian (600) ordained that every hour should be announced by sound of bell, that the people might be warned of the approach of the *horæ canonicæ*, or hours of devotion. Bells came into use in the east in the 9th c., and in Switzerland and Germany in the 11th century. Most of the bells first used in Western Christendom seem to have been hand-bells. Several examples, some of them, it is believed, as old as the 6th c., are still preserved in Ireland, Scotland, and Wales. They are made of thin plates of hammered iron, bent into a four-sided form, fastened with rivets, and brazed or bronzed. Perhaps the most remarkable is that which is said to have belonged to St. Patrick, called the *Clog-an-cadhachta Phatraic*, or "the bell of Patrick's Will." It is 6 in. high, 5 in. broad, and 4 in. deep, and is kept in a case or shrine of brass, enriched with gems and with gold and silver filagree, and made (as an inscription in Irish shows) between the years 1091 and 1105. The bell itself is believed to be mentioned in the *Annals of Ulster* as early as the year 552. Engravings as well of the bell as of its shrine, with a history of both, by the Rev. Dr. Reeves of Lusk, were published at Belfast (where the relic is preserved) in 1850. Some of the Scotch bells, of the same primitive type, are figured and described in the *Illustrated Catalogue of the Archæological Museum at Edinburgh in* 1856 (Edin. 1859). The four-sided bell of St. Gall, an Irish missionary, who died about 646, is still shown in the monastery of the city which bears his name in Switzerland. Church-bells were suspended either in the steeples or church-towers, or in special bell-towers. They were long of comparatively small size; the bell which a king presented to the church of Orleans in the 11th c., and which was remarkable in its age, weighed only 2600 pounds. In the 13th c., much larger bells began to be cast, but it was not until the 15th c. that they reached really considerable dimensions. The bell "Jacqueline" of Paris, cast in 1400, weighed 15,000 pounds; another Paris bell, cast in 1472, weighed 25,000 pounds; the famous bell of Rouen, cast in 1501, weighed 36,364 pounds. The largest bell in the world is the great bell or monarch of Moscow, above 21 ft. in height and diameter, and weighing 193 tons. It was cast in 1734, but fell down during a fire in 1737, was injured, and remained sunk in the earth till 1837, when it was raised, and now forms the dome of a chapel made by excavating the space below it. Another Moscow bell, cast in 1819, weighs 80 tons. The great bell at Pekin, 14 ft. high, with a diameter of 13 ft., weighs 53½ tons; those of Olmütz, Rouen, and Vienna, nearly 18 tons; that first cast for the new palace at Westminster (but cracked), 14 tons; that of the Roman Catholic cathedral at Montreal (cast 1847), 13½ tons; "great Peter," placed in York Minster 1845, 10¾ tons; "great Tom" at Lincoln, 5½ tons; great bell of St. Paul's, 5 1/10 tons.—See an interesting article on Bells in the *Quarterly Review* for Sept., 1854.

From old usage, bells are intimately connected with the services of the Christian church—so much so, that apparently from a spirit of opposition, the Mohammedans reject the use of bells, and substitute for them the cry of the Imaum from the top of the mosques. Associated in various ways with the ancient ritual of the church, bells acquired a kind of sacred character. They were founded with religious ceremonies (see Schiller's ode), and consecrated by a complete baptismal service; received names, had sponsors, were sprinkled with water, anointed, and finally covered with the white garment or chrisom, like infants. This usage is as old as the time of Alcuin, and is still practiced in Roman Catholic countries. Bells had mostly pious inscriptions, often indicative of the wide-spread belief in the mysterious virtue of their sound. They were believed to disperse storms and pestilence, drive away enemies, extinguish fire, etc. A common inscription in the middle ages was:

Funera plango, fulgura frango, Sabbata pango,
Excito lentos, dissipo ventos, paco cruentos.

Among the superstitious usages recorded to have taken place in old St. Paul's church in London, was the "ringinge the hallowed belle in great tempestes or lightninges" (Brand's *Popular Antiquities*, vol. ii.). From this superstition possibly sprang the later notion, that when the great bell of St. Paul's tolled (which it does only on the death of a member of the royal family, or a distinguished personage in the city) it turned all the beer sour in the neighborhood—a fancy facetiously referred to by Washington Irving in the *Sketch-Book*. It would seem that the strange notion that bells are efficacious in dispelling storms, is by no means extinct. In 1852, the bishop of Malta ordered the church-bells to be rung for an hour to allay a gale.

Church-bells were at one time tolled for those passing out of the world. It was a prevailing superstition that bells had the power to terrify evil spirits, no less than to dispel storms; and the custom of ringing what was called the *passing-bell*, "grew [we quote the writer in the *Quarterly Review* above referred to] out of the belief that devils troubled the expiring patient, and lay in wait to afflict the soul the moment when it escaped from the body." . . . "The tolling of the passing-bell was retained at the reformation; and the people were instructed that its use was to admonish the living, and excite them to pray for the dying." But "by the beginning of the 18th c., the passing-bell, in the proper sense of the term, had almost ceased to be heard. The tolling, indeed, continued in the old fashion; but it took place after the death, instead of

before." The practice of slowly and solemnly tolling church-bells at deaths, or while funerals are being conducted, is still a usage in various parts of the country, more particularly as a mark of respect for the deceased. There is another use of the bell in religion, called the *pardon* or *ave bell*, abolished among Protestants. The pardon-bell was tolled before and after divine sèrvice, for some time prior to the reformation, to call the worshipers to a preparatory prayer to the Virgin Mary before engaging in the solemnity, and an invocation for pardon at its close. Bishop Burnet has recorded the order of a bishop of Sarum, in 1538, concerning the discontinuance of the custom. It runs thus: "That the bell called the pardon or ave bell, which of longe tyme hathe beeu used to be tolled three tymes after and before divine service, be not hereafter in any part of my diocesse any more tollyd."

The ringing of the *curfew-bell*, supposed to have been introduced into England by William the conqueror, was a custom of a civil or political nature, and only strictly observed till the end of the reign of William Rufus. Its object was to warn the public to extinguish their fires and lights at eight o'clock in the evening. The eight o'clock ringing is still continued in many parts of England and Scotland.

As the liberty of public worship in places of meeting by themselves was yielded to dissenters, by the various governments of Europe, only with reluctance, the use of bells in chapels as a summons to divine service is not allowed except in the more enlightened countries. Speaking on this subject as referring to England, lord chief-justice Jervis, in giving judgment on a case tried at the Croydon assizes in 1851, says: "With regard to the right of using bells in places of worship at all, by the common law, churches of every denomination have a full right to use bells, and it is a vulgar error to suppose that there is any distinction at the present time in this respect." Throughout England and Scotland, however, comparatively few dissenting places of worship possess bells—still fewer have steeples. In towns and villages, the places of worship connected with the established church are commonly distinguished by some kind of belfry or bell-cote with bells. The ringing of these for divine service on Sundays, and on other occasions, forms the theme of many poetical allusions. The lines of Cowper will occur to recollection:

> How soft the music of those village bells,
> Falling at interval, upon the ear,
> In cadence sweet! now dying all away,
> Now pealing loud again, and louder still,
> Clear and sonorous as the gale comes on.

On all that belongs to the playing of bells in belfries, the inventive genius of the Netherlands long since arrived at proficiency. In some of the church-towers of that country, the striking, chiming, and playing of bells is incessant; the tinkling called chimes usually accompanies the striking of the hours, half-hours, and quarters; while the playing of tunes comes in as a special divertisement. In some instances, these tune-playing bells are sounded by means of a cylinder, on the principle of a barrel-organ; but in others, they are played with keys by a musician. The French apply the term *carillons* to the tunes played on bells; but in England, it is more usual to give the term carillons to the suites of bells which yield this kind of music. In this last sense, the tower of *Les Halles*, a large building at Bruges, is allowed to contain the finest carillons in Europe. There is a set of music-bells of this kind in the steeple of St. Giles's church, Edinburgh. On these, tunes are played for an hour daily at certain seasons by a musician, who has a small salary from the civic corporation.

Many of the church-towers in London are provided with peals of bells, the ringing of which is a well-known practice. Eight bells, which form an octave or diatonic scale, make the most perfect peal. The variety of *changes* or permutations of order that can be rung on a peal, increases enormously with the number of bells: 3 bells allow 6 changes; 4 bells, 24; 12 bells give as many as 479,001,600 changes. The ringing of peals differs entirely from tolling—a distinction not sufficiently recognized in those places where an ordinary ringing of bells is made to suffice alike for solemn and festive occasions. The merry peal almost amounts to an English national institution. It consists in ringing the peal in moderately quick time, and in a certain order, without interruption, for the space of an hour. Merry peals are rung at marriages (if ordered), and at other festive events, the ringers being properly paid, according to use and wont. The English appear to be fond of these peals, and the associations which they call up. They actually make bequests to endow periodical peals in their parish church-towers; leaving, for example, so much money to ring a merry peal for an hour on a certain evening of the week, or to commemorate victories, or some other subjects of national rejoicing, in all time coming. One of the most celebrated peals of bells in London is that of St. Mary-le-Bow, Cheapside, which form the basis of a proverbial expression meant to mark emphatically a London nativity—"Born within the sound of Bow-bells." Brand speaks of a substantial endowment by a citizen for the ringing of Bow-bells early every morning to wake up the London apprentices. The ringing of bells in token of merriment is an old usage in England, as we learn from Shakespeare:

> Get thee gone, and dig my grave thyself,
> And bid the merry bells ring to thy ear,
> That thou art crowned, not that I am dead.

Sometimes, in compliment to a newly opened church, efforts are made to furnish its belfry with the proper number of bells, and to endow it at once for a weekly merry peal.

It is common for some of the humbler class of parishioners to form a company of bell-ringers, acting under the authority of the church-wardens. Some endowments for peals embrace a supper, as well as a money payment to the ringers; and of course, in such circumstances, there is little risk of the merry peal falling into desuetude. The consequence is, that what with marriages, and other festive celebrations, and as a result of endowments, merry peals are almost constantly going on somewhere in the metropolis—a fine proof, it may be said, of the naturally cheerful and generous temperament of the English, and of their respect for old customs. In Lancashire, the art of playing on bells is cultivated with much enthusiasm and success. The bells are small, and arranged on a movable stand; they are struck by a small instrument which is held in each hand of the performer, and produce a sweet tinkling kind of music.

The custom of hanging bells on the necks of horses, cows, and other animals, was in use by the Romans, and still survives. The bells give notice of approach in the dark, and hung on cows, goats, or sheep, these animals can be easily found in the woods, or on the mountains. The charming poetical allusion of Gray—

And drowsy tinklings lull the distant folds—

will be called to remembrance. In some parts of England, as many as eight small bells, forming an octave, are attached to the harness of wagon-horses. The attaching of bells in a fanciful manner to riding and sleigh-horses is common in some parts of Europe and America.

The term bell is infused in much of our conversational phraseology. "To bear the bell," is a phrase which we previously attempted to explain. At one period, a silver bell was the prize in horse-races in England, and the winning horse was said to bear away the bell. A less probable explanation is, that the phrase originated in the custom of one of the most forward sheep in a flock carrying a bell. Hence, at least, "bell-wether of the flock," a phrase applied disparagingly to the leader of a party. The old fable, in which a sagacious mouse proposes that a bell shall be hung on the neck of the cat, so that all the mice may be duly warned of her approach, has given rise to the well known-phrase of "belling the cat." Any one who openly and courageously does something to lower the offensive pretensions of a powerful and dangerous person, is said "to bell the cat."

The *hanging of bells* in dwelling-houses, and ringing them by means of wires from the different apartments, is quite a modern invention; for it was not known in England in the reign of queen Anne. Lately, there has been a great improvement in domestic bell-hanging. Instead of traversing the apartments, and turning and winding by means of cranks, the wires are carried directly upward in tubes in the walls to the garret: thence from a row of cranks they descend together to their respective bells, which are hung in one of the lower passages. More recently, there has been introduced a system of electric bells, which is likely to supersede all others. The arrangement consists of an electro-magnet, with its armature fastened at one end by a spring, and terminating at the other in a hammer, by which the bell is struck. The battery may be placed in any part of the building, and as there is no motion in the wires, no cranks or other apparatus are required. Contact is made by pressing a stud, and messages may be sent to any part of the house, by the Morse alphabet, or other code of signals.

BELL, a co. in s.e. Kentucky, bordering on West Virginia and Tennessee, and drained by the Cumberland river; 500 sq.m.; pop. '80, 6,055—180 colored. The surface is rough, and in some parts mountainous. Agriculture is the principal business. Co. seat, Pineville. This co. was formerly called Josh Bell.

BELL, a co. in w. Tennessee on the Mississippi, recently established; a good cotton section. Co. seat, Grand Junction.

BELL, a co. in Texas, in a fine prairie region on the Leon river, well adapted to general agriculture; 850 sq.m.; pop. '70, 9771—1104 colored. Co. seat, Belton.

BELL, ANDREW, D.D., author of the *Madras System of Education*, was born at St. Andrews in 1753, and educated at the university of that place. Subsequently he took orders in the church of England; and after residing for some time in British America was appointed one of the chaplains at fort St. George, Madras. While here he was intrusted by the directors of the East India company with the management of an institution for the education of the orphan children of the European military. The arduous character of his new duties compelled him to reflect seriously on the best means of fulfilling them. As he found it impossible to obtain the services of properly qualified ushers, he at length resorted to the expedient of conducting the school by the aid of the scholars themselves. Hence originated the far-famed "MONITORIAL SYSTEM" (q.v.). After superintending the institution for seven years, the state of his health forced him to return to Europe. On his departure he received a most flattering testimonial from the directors of the school. In 1797, after his arrival in England, B. published a pamphlet entitled *An Experiment in Education, made at the Male Asylum of Madras; suggesting a System by which a School or Family may teach itself under the Superintendence of the Master or Parent.* This pamphlet attracted little attention until Joseph Lancaster, a dissenter, commenced to work upon the system, and succeeded in obtaining for it a large measure of public recognition. In 1803, Lancaster also published a tractate on education, recommending the monitorial system, as it was now called, and admitting B. to be the original

inventor of it, an admission which he afterwards discreditably retracted. Lancasterian schools now began to spread over the country. The church grew alarmed at the successful results of the efforts made by dissenters to educate the poor, and resolved to be philanthropical ere it was too late. B. was put up against Lancaster. Money was collected and an immense amount of emulation was excited in the bosoms of churchmen. Fortunately, however, this rivalry produced only beneficial effects, and the motives which induced it may therefore be forgotten. Later in life B. was made a prebendary of Westminster, and master of Sherborn hospital, Durham. He was also a member of various learned societies. He died at Cheltenham, Jan. 28, 1832. He left (besides a valuable estate) £120,000 of three per cent stocks for the purpose of founding various educational institutions in Edinburgh, Glasgow, Leith, Aberdeen, Inverness, Cupar, and St. Andrews.

BELL, Sir CHARLES, an eminent surgeon, whose discoveries in the nervous system have given him a European fame, was born at Edinburgh in 1778, and while a mere youth assisted his brother John (afterwards noticed) in his anatomical lectures and demonstrations. In 1797 he was admitted a member of the Edinburgh college of surgeons, and soon after appointed one of the surgeons of the royal infirmary. In 1806 he proceeded to London, and for some years lectured with great success on anatomy and surgery at the academy in Great Windmill street. Admitted, in 1812, a member of the royal college of surgeons, London, he was elected one of the surgeons of the Middlesex hospital, in which institution he delivered clinical lectures, and raised it to the highest repute. To obtain a knowledge of gunshot wounds, he twice relinquished his London engagements—the first time after the battle of Corunna in 1809, when he visited the wounded landed on the southern coasts of England; the other after the battle of Waterloo, when he repaired to Brussels and was put in charge of a hospital with 300 men. In 1824, he was appointed senior professor of anatomy and surgery to the royal college of surgeons, London, and subsequently a member of the council. On the establishment of the London university, now university college, in 1826, B. was placed at the head of their new medical school. He delivered the general opening lecture in his own section, and followed it by a regular course of characteristic lectures on physiology; but soon resigned, and confined himself to his extensive practice, which was chiefly in nervous affections. In 1831 he was one of the five eminent men in science knighted on the accession of William IV., the others being sir John Herschel, sir David Brewster, sir John Leslie, and sir James Ivory. In 1836 he was elected professor of surgery in the university of Edinburgh. He was a fellow of the royal societies of London and Edinburgh, and a member of some other learned bodies. Author of various works on surgery and the nervous system, and editor, jointly with lord Brougham, of Paley's *Evidences of Natural Religion*, B. was one of the eight distinguished men selected to write the celebrated *Bridgewater Treatises*, his contribution being on *The Hand, its Mechanism and Vital Endowments, as evincing Design* (1834). He died suddenly, April 30, 1842. Among his principal works are: *The Anatomy of the Brain Explained in a Series of Engravings*, 12 plates (Lond. 1802, 4to); *A Series of Engravings Explaining the Course of the Nerves*, (Lond. 1804, 4to); *Essays on the Anatomy of Expression in Painting*, plates (Lond. 1806, 4to); posthumous edition much enlarged, entitled *The Anatomy and Philosophy of Expression as connected with the Fine Arts* (Lond. 1844, 8vo); *A System of Operative Surgery*, 2 vols. (Lond. 1807-9; 2d ed. 1814); *Dissertation on Gunshot Wounds* (Lond. 1814, 2 vols. 8vo); *Anatomy and Physiology of the Human Body*, 3 vols. (1816); various papers on the nervous system which originally appeared in the *Philosophical Transactions; Exposition of the Natural System of the Nerves of the Human Body* (1824); *Institutes of Surgery* (Edin. 2 vols. 1838, 12mo); Animal Mechanics, contributed to the *Library for the Diffusion of Useful Knowledge* (1828); *Nervous System of the Human Body* (1830), 4to. See *Correspondence of Sir Charles B.* (1870).

BELL, CHARLES H., 1798-1875; b. N. Y.; rear-admiral in the U. S. navy. He served in the war with England in 1812, and in the rebellion, rising to commodore in 1862, and admiral in 1866.

BELL, GEORGE JOSEPH, an eminent lawyer, brother of Sir Charles, was b. at Edinburgh, March 26, 1770, and passed advocate in 1791. Acknowledged one of the greatest masters of commercial jurisprudence of his time, and in particular of that department of it which relates to the laws of bankruptcy, he was, in 1822, appointed professor of Scots law in Edinburgh university; and in 1823, a member of the commission for inquiring into Scottish judicial proceedings. Subsequently, he was member of a commission to examine into and simplify the mode of procedure in the court of session. On the report, drawn up by Bell, was founded the Scottish judicature act, prepared by him, which effected many important changes in the forms of process in the superior courts of Scotland; the jury court being abolished as a separate judicature, and conjoined with the court of session. Appointed in 1831 one of the clerks of the court of session, he was, in 1833, chairman of the royal commission to examine into the state of the law in general. He also prepared a bill for the establishment of a court of bankruptcy in Scotland. His principal works are—*Commentaries on the Laws of Scotland, and on the Principles of Mercantile Jurisprudence* (Edin. 1810, 4to; 5th ed. 1826, 2 vols. 4to); *Principles of the Law of Scotland* (Edin. 1829, 8vo; 4th ed. 1839, 8vo); and *Commentaries on the*

Recent Statutes Relative to Diligence or Execution against the Movable Estate, Imprisonment, Cessio Bonorum, and Sequestration in Mercantile Bankruptcy (Edin. 1840, 4to). Bell d. Sept. 23, 1848.

BELL, HENRY, the successful introducer of steam-navigation into Europe, fifth son of Patrick Bell, a mechanic, was b. at Torphichen, Linlithgowshire, Scotland, April 7, 1767. After working three years as a stone-mason, he was, in 1783, apprenticed to his uncle, a mill-wright. He was instructed in ship-modeling at Borrowstounness, and completed his knowledge of mechanics with an engineer at Bell's Hill. Repairing to London, he was employed by the celebrated Mr. Rennie. About 1790 he returned to Glasgow, and in 1808 removed to Helensburgh, where he kept the principal inn, and devoted himself to mechanical experiments. How far Bell was anticipated by Fulton and others, in his application of steam to navigation, will be considered under the head of STEAM NAVIGATION. In January, 1812, a small vessel, 40 ft. in length, called the *Comet*, built under his directions, and with an engine constructed by himself, was launched on the Clyde with success—the first on European waters. Five years previously, on Oct. 3, 1807, Mr. Fulton, a Scottish engineer in America, had placed the first steamboat on the Hudson. Bell d. at Helensburgh, Nov. 14, 1830. A monument was erected to his memory at Dunglass point on the Clyde.

BELL, HENRY H., 1807–67; b. N. C.; an American naval officer, capt. in 1862, commodore the next year, and rear-admiral in 1866. He was fleet capt. under Farragut at the capture of New Orleans. In 1867, he commanded the East India squadron, and was drowned while endeavoring to get his barge over the bar at the entrance of Osada river, Japan.

BELL, JOHN, 1797–1869; b. Tenn.; a graduate of Nashville university; a lawyer, and member of congress for 14 years from 1827. In 1834, he was speaker of the house of representatives, in 1841 secretary of war; was chosen senator in 1847, and again in 1853. In 1860, he was one of the four candidates for president of the United States, and got the votes of Kentucky, Tennessee, and Virginia, 39 in all.

BELL, JOHN, of Antermony, a celebrated Asiatic traveler, born in the w. of Scotland in 1691, studied for the medical profession. In 1714, he went to St. Petersburg, and soon after was appointed physician to an embassy from Russia to Persia. In 1719, he was sent upon another to China, through Siberia. In 1737, he was sent on an embassy to Constantinople, and afterwards settled for some years in the Turkish capital as a merchant. In 1747, he returned to Scotland, and died at Antermony, July 1, 1780. His *Travels from St. Petersburg to various Parts in Asia*, in 2 vols. 4to, were published by subscription at Glasgow in 1763. From its simplicity of style, the work has been described as "the best model, perhaps, for travel-writing in the English language."

BELL, JOHN, an eminent surgeon, second son of the Rev. William Bell, an Episcopal minister in Edinburgh, was b. in that city, May 12, 1763. He studied under the celebrated Black, Cullen, and Monro *secundus;* and while attending the anatomy classes of Dr. Monro, first conceived the idea of teaching the application of the science of anatomy to practical surgery. He commenced, in 1786, lecturing at Edinburgh on surgery and anatomy, and in 1793 published the first volume of his *Anatomy of the Human Body;* in 1797, appeared the second volume; and in 1802, the third. A volume of anatomical drawings by himself, illustrative of the structure of the bones, muscles, and joints, was published in 1794; and another volume, illustrative of the arteries, with drawings by his brother, afterwards sir Charles Bell, appeared in 1801. In 1798, Bell passed some weeks at Yarmouth among the seamen of lord Duncan's fleet wounded at Camperdown; and in 1800 he published a *Memorial concerning the Present State of Military Surgery.* His *System of the Anatomy of the Human Body*, and his *Discourses on the Nature and Cure of Wounds* (Edin. 1793–95), were translated into German. A good classical scholar, he was distinguished alike for his great conversational powers and general information. Early in 1816, he was thrown from his horse, and, his health declining, he went to Paris, and thence proceeded to Italy. He died at Rome, of dropsy, April 15, 1820. Besides the works mentioned, he was the author of *The Principles of Surgery*, 3 vols. 4to, 1801–1807; new edition, edited by his brother, sir Charles Bell, 1826. A posthumous work, entitled *Observations on Italy*, edited by bishop Sandford of Edinburgh, was published by his widow.

BELL, JOHN, an eminent sculptor, remarkable for rejecting the classical antique model, and following nature only in his works, b. in Norfolk in 1811, first exhibited at the royal academy, London, in 1832, a religious group. His works are numerous, and of high and original merit. B.'s statues of lord Falkland, exhibited in model at Westminster hall, 1847, and sir Robert Walpole, 1854, were commissioned for the new houses of parliament. One of his best known designs is a monument to the guards who fell in the Crimea, executed in 1858. In decorative art, he has also distinguished himself. He was one of the sculptors of the prince consort memorial in Hyde park, London, which was unveiled in 1873. B. is the author of a *Free Hand Drawing-book for the Use of Artisans.*

BELL, LUTHER V., LL.D., 1806–62; b. N. H.; graduate of Bowdoin, and in medicine of Dartmouth; practiced in New York, and was president of the asylum for the insane

at Somerville, Mass. In 1861, he was made brigade surgeon in the army, and at the time of his death was medical director of a division.

BELL, ROBERT, an industrious and versatile literary writer, the son of a magistrate, was b. at Cork, 10th Jan., 1800, and, when very young, obtained an appointment in a government department in Dublin. He was for a time editor of the government journal, *The Patriot*. In 1828, he removed to London, and was appointed editor of *The Atlas* newspaper. In 1839, in conjunction with sir Edward Bulwer Lytton and Dr. Lardner, he started *The Monthly Chronicle*, a literary periodical, published by Longman & Co.; and latterly was editor of it. In 1841, he retired from *The Atlas*. For Lardner's Cyclopædia, Bell wrote *The History of Russia*, 3 vols., and *The Lives of the English Poets*, 2 volumes. The last volume of Southey's *Naval History*, left unfinished by the author, was also written by him, as was the concluding volume of Mackintosh's *History of England*. At the London theaters, three five-act comedies have been produced by him. He was author, also, of *The Ladder of Gold*, a novel, 3 vols., 1850; *Heart and Altars*, a collection of tales, 3 vols.; *Life of Canning; Outlines of China; Memorials of the Civil War*, consisting of the Fairfax correspondence, 2 vols.; *Wayside Pictures through France, Belgium, and Holland*. In 1854, he commenced an annotated edition of the English poets; and received from the king of the Belgians a gold medal, as a token of his majesty's sense of his services to literature. He died in 1867.

BELL, THOMAS, a distinguished naturalist, the son of a medical practitioner, was b. at Poole, Dorsetshire, in 1792. In 1814, he went to London, and studied at Guy's hospital, and, in 1815, passed the college of surgeons. In 1817, he commenced a course of annual lectures on dental surgery at Guy's hospital, where he also for some time delivered lectures on comparative anatomy. He was one of the founders of, and a principal contributor to, *The Zoological Journal*, of which five volumes were published; also one of the members of the zoological club of the Linnæan society, afterwards incorporated with the zoological society. Elected in 1828 a fellow of the royal society, in 1840 he was appointed its secretary. In 1836, he became professor of zoology in king's college, London. On the establishment of the Ray society, in 1844, for the publication of rare and costly works on natural history, he was elected its first president. In 1853, he resigned the secretaryship of the royal society, on being elected president of the Linnæan society. He is author of a *History of British Reptiles*, in Van Voorst's series of British natural history, 1829; a *History of British Quadrupeds*, same series, 1836; and a *History of the British Stalk-eyed Crustacea*, same series, 1853. In 1833, he commenced a *Monograph of the Testudinata*. The article "Reptiles," in Darwin's *Zoology of the Voyage of the Beagle*, was written by Bell. His last work of interest was a new edition of Gilbert White's *Natural History and Antiquities of Selborne*, on which he began to busy himself in 1872. B. is appropriately the proprietor of the manor of Selborne.

BELLA, a thriving t. of Italy, in the province of Basilicata, with a pop. of between 5000 and 6000.

BELLA, STEFANO DELLA, a famous Italian engraver, was b. at Florence, 18th May, 1610. He was intended for a goldsmith, but he soon left that calling and devoted himself to engraving. He executed upwards of 1400 different works, of almost all subjects —battles, sea-pieces, landscapes, animals, etc. All are characterized by freedom and delicacy, and give evidence of high imagination on the part of the author, and also of much patient and careful manipulation. One of his most admired works is a view of the Pont-Neuf, Paris. He died 12th July, 1664.

BELLADONNA, DWALE, or DEADLY NIGHTSHADE (*Atropa belladonna*), a plant of the natural order *solanaceæ* (q.v.); an herbaceous perennial, growing up every year as a bush, from two to six feet high, with ovate entire leaves, and bell-shaped flowers of a lurid purple color, which are fully larger than those of the common harebell, stalked and solitary in the axils of the leaves. It produces berries, of the size of a middle-sized cherry, and which, when ripe, are of a shining black color, and of a sweetish and not nauseous taste, although the whole plant has a disagreeable heavy smell. It is a native of the southern and middle parts of Europe, and is not uncommon in England, in the neighborhood of towns and of ruins. All parts of the plant are narcotic and poisonous, and fatal consequences not unfrequently follow from the eating of its berries, which have an inviting appearance. Its roots have sometimes been mistaken for parsnips. Dryness of the mouth and throat, dilatation of the eyes, obscurity of vision, paralytic tremblings, loss of sensation, delirium, and stupor, are among the effects of poisoning by belladonna. When death takes place from this cause, corruption ensues with extraordinary rapidity. B. is, however, of great value in medicine, soothing irritation and pain, particularly in nervous maladies, and is administered both internally and externally in the form of extract, tincture, ointment, and plaster, which are generally prepared from the dried leaves, sometimes from the root. It is particularly useful, from its power of dilating the pupil of the eye, and is constantly employed by oculists, both for examinations and operations. It is also applied to the eye to diminish the sensibility of the retina to light. It has recently been recommended as a preventive of scarlet fever, apparently on the ground of its tendency, when administered in frequent small doses, to produce an eruption and an affection of the throat, somewhat similar to those

characteristic of that disease; but the evidence of its utility for this purpose is not sufficient to warrant confidence.—The name B., i.e., fair lady, is supposed to have originated in the employment of the juice for staining the skin. The name dwale is apparently from the same root with the French *deuil*, grief—an allusion to the same qualities which have obtained for the plant the appellation of deadly nightshade. *Atropa* is from *Atropos*, one of the fates.—The other species of *Atropa* are South American.

B. owes its active properties on the animal system to the presence of the alkaloid *atropine*, accompanied by another alkaloid, *belladonnine*. The alkaloid atropine is present in all parts of the plant, and in all the preparations. It is generally procured from the root of B., and then forms needle-shaped crystals, which are sparingly soluble in water, but readily dissolve in alcohol and ether. Atropine is a very active poison, and its effects on the animal system resemble in an intensified degree the manner in which B. acts. It has been introduced into medicine, along with its nitrate, its sulphate, and its hydrochlorate.

BELLADONNA LILY, *Amaryllis belladonna*, a very beautiful species of amaryllis (q.v.), with rose-colored drooping flowers clustered at the summit of the leafless flowering stem. It is a native of the cape of Good Hope and of the West Indies, has become naturalized in Madeira, and is a not unfrequent ornament of gardens in England. The flowering stem is about 18 in. high.

BELLAI, or BELLAY, GUILLAUME DU, lord of Langley; 1491–1543; a French gen., distinguished in the service of Francis I. He was an able soldier and diplomatist, Charles V. remarking that Langley's pen had fought more against him than all the lances in France. When Henry VIII. was seeking divorce from Catherine, Langley worked earnestly in favor of the king. His chief writings are his own memoirs in 7 vols. He was buried in the church of Mans, where a noble monument was erected to his memory.

BELLAIRE, a city in Belmont co., Ohio, on the Ohio river, 5 m. below Wheeling, on the Baltimore and Ohio, and the Cleveland and Pittsburgh railroads. Pop. '70, 4,033; in '80, 8,028. There are many manufacturing establishments, including glass-houses, nail factories, planing mills, etc. The city is supplied with gas and water, and has street railroads. Its growth has been very rapid.

BELLAMONT, or BELLOMONT, RICHARD COOTE, Earl of, 1636–1701; English governor of the colonies of New York and Massachusetts; a member of parliament and an early advocate of the cause of William of Orange; attainted in 1689, but was the same year made earl, and appointed receiver general to queen Mary. He was sent out as governor in 1698. He was popular with the people of the colonies, though suspected of a degree of hypocrisy in religion. Under his administration the famous capt. William Kidd was taken, sent to England, and hanged on charge of piracy.

BELLAMY, JACOBUS, a distinguished Dutch poet, was b. at Vliessingen (Flushing), Nov. 12, 1757, and d. Mar. 11, 1786. His parents were very poor, and he was indebted for his education to the patronage of a clergyman, and other persons, who had seen and admired the patriotic effusions of his boyish muse, and who subscribed to send him to the university of Utrecht. Here the talents already remarked in B. were devoted chiefly to poetry, though his benefactors had hoped that he would devote himself to theology. His first sentimental and anacreontic poems, published at Amsterdam in 1782, were followed by a series of earnest patriotic poems (*Vaderlandsche Gezangen*), and in the same year, a third volume full of merit (1785). A collected edition of his works appeared at Haarlem (1826), but it does not contain his most popular poem, *Roosje*. B. was possessed of a glowing spirit and fancy, as well as a fine taste and ease in composition. He deservedly ranks as one of the chief restorers of national literature in Holland.

BELLAMY, JOSEPH, D.D., 1719–90; b. Conn., graduate of Yale, and Congregational pastor; famous for the pungency of his preaching. His sermons and other doctrinal works have been published. He prepared many candidates for the ministry.

BELLARMINE, ROBERT, one of the most celebrated Catholic theologians, was b. at Monte Pulciano, in Tuscany, Oct. 4, 1542. He entered the order of Jesuits in 1560, and was distinguished among his *confrères* by the zeal with which he studied theology, the church-councils, the fathers, Hebrew, history, and the canon law. In 1563, he gave lessons in polite literature and astronomy at Florence; and in rhetoric, at Mondovi, 1564–'67. In his 27th year, when he went to Louvain as professor of theology, he began that long controversy with "heretics" which formed the main business of his life. In 1599, when he was made a cardinal against his own inclination, he used his influence over pope Clement VIII. to prevent the introduction of the Platonic philosophy into the university of Rome, on the ground of its being "pernicious;" but though himself a Jesuit, he honorably opposed the Dominicans with regard to the Pelagian writings of Molina. He seems, however, to have participated to some extent in that writer's suicidal ethics, for in his *Disputationes* he argues that, as the pope is the supreme authority in doctrine and morals, if he should call virtue vice, and vice virtue, we are bound to believe him, and to act accordingly. In 1602, he was appointed archbishop of Capua. After the death of Clement VIII., he contrived to escape promotion to the papal chair, but was induced by Pius V. (1605) to hold an important place in the Vatican, where he remained until the time of his death, which took place in the novitiate-house of the

Jesuits, Sept. 17, 1621. In his work, *De Potestate Pontificis in Temporalibus* (On the Pope's Power in Secular Matters), he introduced the doctrine that the pope must be held as supreme over all kings. On this account the book was condemned as treasonable in Paris, Venice, and Mentz. His chief work contains the disputations held in the Jesuits' college at Rome, 1576–81, *Disputationes de Controversiis Fidei adversus hujus Temporis Hereticos* (3 vols., Rome, 1581; 4 vols., Prague, 1721; 4 vols., Mayence, 1842). These disputations are regarded by Catholics as the best arguments for their tenets. There can be no question of their merits with regard to erudition and adroitness in controversy; but as Gerhard, in his *Bellarminus Orthodoxias Testis* (Jena, 1651–83), and Dallæus have shown, many of the conclusions are far from being sound or logical. Industry, clearness, and acuteness are the chief merits of Bellarmine's great work; but it is seriously lessened in value by subtility, forced conclusions, and a very defective exegesis—faults which have long been evident to enlightened Catholic writers themselves. Among his other writings, the most able is the *Christianæ Doctrinæ Applicatio*, originally written in Italian, and now translated into all the European languages. Pope Urban VIII., at the instigation of the Jesuits, declared Bellarmine to be a "faithful servant of God;" but his canonization as a saint has hitherto been opposed. Complete editions of his works have been published at Venice, 5 vols., 1721; and Cologne, 7 vols., 1619. His life was written in Italian by the Jesuit Fuligatti (Rome, 1624); and translated into Latin by Petra Sancta (Liege, 1626).

BELLA'RY, a district of British India in the presidency of Madras, bounded on the n. by the Nizam's territories, on the e. by Cuddapah, on the s. by Mysore, and on the w. by Dharwar. With an area of 11,007 sq.m., it extends in n. lat. between 13° 40′ and 15° 58′; and in e. long. between 75° 44′ and 78° 19′. Pop. '72, 1,663,006. The peculiarities of the district are connected with its situation. Elevated on the e. slope of the w. Ghauts, B. enjoys so healthy a climate, that it has been officially recommended as the site of a sanatorium for the neighboring provinces. Screened by the Ghauts from the s.w. monsoon, and protected against the n.e. one by its distance from the bay of Bengal, B. receives, on an average, less rain than any other portion of southern India—the annual fall ranging between about 12 in. and about 26 inches. Hence all its subordinate streams become, in the dry season, mere expanses of sand, which, excepting when bound together by the growth of the nuth-grass, is apt to encroach from year to year, like a glacier, over the bordering grounds. B., in fact, may in a great measure be said to be habitable through artificial means. Irrigation, though rude, is yet ingenious; dug wells amount to 22,000; of tanks there are 1400; and weirs or dams of huge stones, to the number of 331, cross the various watercourses, so as to form, after the rains, so many reservoirs.

BELLA'RY, the chief t. of the above district, is situated about 330 m. s.e. of Bombay, and 270 n.w. of Madras. Lat. 15° 8′ n., and long. 76° 59′ e. As one of the principal military stations in the presidency of Madras, it is connected by good roads with Belgaum, Bangalore, Hyderabad, and Madras itself. The fort stands on a rock two miles round, and 450 ft. high; and is supplied with water from tanks excavated in the solid granite. Besides the fort and adjacent cantonments, B. contains a native town, which numbers about 52,000 inhabitants.

BELLAY, JOACHIM DU, 1524–60; an eminent French poet. His youth was humble, and he was unknown until, at the age of 24, he met Ronsard, when a mutual friendship at once began. He joined the six poets who, under Dorat, were forming the "Pleiad," a society for the creation of a French school of renaissance poetry, and Bellay's first contribution was a prose volume, the *Defense and Illustrations of the French Language*, a remarkably strong piece of criticism. A year later he published the *Recueil de Poesie*, and a collection of love sonnets in the manner of Petrarch. In 1550, B. was sent to Rome, where he fell in love with a married lady, and to her addressed much of his best poetry. At last he won her, and his Latin poems end in rapturous delight. He was recalled to France and made a canon in Notre Dame, Paris. Thenceforward his brief life was one of social trouble but of literary activity. Finally, in 1560, when just nominated to be archbishop of Bordeaux, he suddenly died, and was buried in Notre Dame. Like Ronsard, he was very deaf. B. was long called the French Ovid. Spenser translated many of his sonnets into English.

BELL-BIRD, *Casmarynchus carunculata*, a bird found in some of the warm parts of South America, remarkable for the metallic resonance of its cry, which resembles the tolling of a bell, with pauses varying from a minute to several minutes. This bird belongs to a genus nearly allied to the cotingas (q.v.) and wax-wings (q.v.), but characterized by a very broad and much depressed bill, soft and flexible at the base, and hard towards the extremity. It is about the size of a jay; the male is of snow-white plumage, and from his forehead rises a strange tubular appendage, which, when empty, is pendulous, but which can be filled with air by a communication from the palate, and then rises erect to the height of nearly 3 inches. He generally takes his place on the top of a lofty tree, and his tolling can be heard to the distance of 3 miles. It resounds through the forest, not only at morning and evening, but also at midday, when the heat of the blazing sun has imposed silence on almost every other creature.

BELL, BOOK, AND CANDLE. The excommunication by B., B., and C. is a solemnity belonging to the church of Rome. The officiating minister pronounces the formula of excommunication, consisting of maledictions on the head of the person anathematized, and closes the pronouncing of the sentence by shutting the book from which it is read, taking a lighted candle and casting it to the ground, and tolling the bell as for the dead. This mode of excommunication appears to have existed in the western churches as early as the 8th century. Its symbolism may be explained by quoting two or three sentences from the conclusion of the form of excommunication used in the Scottish church before the reformation: "Cursed be they from the crown of the head to the sole of the foot. Out be they taken of the book of life. And as this candle is cast from the sight of men, so be their souls cast from the sight of God into the deepest pit of hell. Amen." The rubric adds: "And then the candle being dashed on the ground and quenched, let the bell be rung." So, also, the sentence of excommunication against the murderers of the archbishop of Dublin in 1534: "And to the terror and fear of the said damnable persons, in sign and figure that they be accursed of God, and their bodies committed into the hands of Satan, we have rung these bells, erected this cross with the figure of Christ; and as ye see this candle's light taken from the cross and the light quenched, so be the said cursed murderers excluded from the light of heaven, the fellowship of angels, and all Christian people, and sent to the low darkness of fiends and damned creatures, among whom everlasting pains do endure."

BELLE-ALLIANCE, the name of a farm in the province of Brabant, Belgium, 13 m. s. of Brussels. It has become famous as the position occupied by the center of the French army in the battle of Waterloo, June 18, 1815. The Prussians gave the name Belle-Alliance to this decisive battle; the French named it from Mont-Saint-Jean, the key of the British position, about 2 m. to the n.; but the English name, Waterloo (q.v), taken from the village where Wellington had his head-quarters, is now commonly used.

BELLECHASSE, a co. of Canada, extending from the border of Maine to the St. Lawrence; 720 sq.m.; pop. '71, 17,637. The chief products are maple sugar, oats, flax, and hay. Chief town, St. Michel.

BELLE DE NUIT (Fr., beauty of the night), a name given to certain tropical species of *convolvulaceæ*, with extremely beautiful and fragrant flowers, which open only during the night. The species to which perhaps the name more particularly belongs, is *calonyction bona nox*, a native of the forests of the West Indies, and of tropical America, with twining stem, spiny branches, heart-shaped leaves, and exquisitely beautiful white flowers of 5 or 6 in. in diameter, which are produced in large many-flowered corymbs.

BELLEFONTAINE, the seat of justice of Logan co., O., 55 m. n.w. of Columbus, on the highest ground in the state; reached by the Cincinnati, Sandusky, and Cleveland railroad; pop. '70, 3182. It has some important manufactures.

BELLEFONTE, a t. in Pennsylvania, seat of justice of Center co., 87 m. w. of Harrisburg, at the base of Bald Eagle mountain, on the Bald Eagle valley railroad, has a number of manufactories, and is a summer resort for its springs and scenery. Pop. '70, 2655; in '80, 3030.

BELLEGARDE, a hill-fortress of France, in the department of Pyrénées Orientales. It is situated on the Spanish confines on the road from Perpignan to Figueras, and in the pass between Col de Portus on the e., and Col de Panzias on the west. Here the French, under Philip III., were defeated by Peter III. of Aragon in 1285. In the 14th c., B. consisted only of a fortified tower. It was captured by the Spaniards in 1674, and again by the French under marshal Schomberg in 1675. After the peace of Nimeguen, 1678–79, a regular fortress, with five bastions, was erected here by order of Louis XIV. In 1793, it was blockaded and taken by the Spaniards under Ricardos, but was retaken by the French in the following year.

BELLE ISLE, an island in the Atlantic, about midway between the n.w. of Newfoundland and the s.e. of Labrador, in lat. 52° n., and long. 56° w. Although on the parallel of Essex in England, it yields little but potatoes and ordinary vegetables. It is chiefly known as giving name to the adjacent strait on the s.w., which, separating Labrador from Newfoundland, forms the most northerly of the three channels between the gulf of St. Lawrence and the open ocean.

BELLE ISLE, CHARLES LOUIS AUGUSTE FOUQUET, Duc de, 1684–1761; a French soldier and statesman, who became lieut.gen. in 1732, and negotiated the treaty, three years later, whereby Lorraine was united to France. He was minister to Germany, and labored to bring the elector of Bavaria to the throne. In the war against Austria he captured Prague, but did not hold it. In 1745, he was a prisoner to the English, but was exchanged, and rose in promotion to duke, peer, member of the academy, and lastly minister of war.

BELLE ISLE, NORTH, an island at the entrance of Belle Isle straits, 52° n., 55° 20′ w., 16 m. from the coast of Labrador. It has a surface of about 15 sq.m., and a harbor for small vessels.

BELLE ISLE, SOUTH, an island off the Newfoundland coast, 16 m. from Canada bay, 51° n., 55° 35′ w. It is about as large as Belle Isle, North.

BELLE ISLE, STRAIT OF, the northern entrance to the gulf of St. Lawrence, running about 80 m. s.w. between Newfoundland and Labrador. Its width is about 12 m., but the navigation is difficult. On the n.w. side are several small bays.

BELLEISLE-EN-MER, an island belonging to France in the department Morbihan, in the Atlantic, 8 m. s. of Quiberon point. Its length is 11 m., and its greatest breadth 7. Pop. '72, 10,894, chiefly engaged in pilchard-fishing. Salt is made on the island. B. is a place of considerable antiquity. The chief town is *Palais* (pop. 2260), a seaport and fortified place. In the 9th c., B. came into the possession of the count of Cornouailles, who bestowed it on the abbey of Redon, afterwards on the abbey of Quimperlé. In the 13th c., the monks of Quimperlé ceded the island to Charles IX., who gave it as a marquisate to the marshal de Retz, who fortified it. His successor sold the island in 1658 to Fouquet, intendant of finance, who further improved and strengthened it. His grandson, the celebrated marshal Belleisle, ceded the island to Louis XV. in exchange for the comté Gisors, 1718. In 1761, it was captured by the English fleet under Keppel, and restored in 1763.

BELLENDEN (BALLANTYNE), JOHN, archdeacon of Moray, a Scottish writer in the reigns of James V. and queen Mary, was born towards the close of the 15th c., somewhere in the e. of Scotland, for in the records of the university of St. Andrews he is entered thus; "1508, *Jo. Ballentyn nac. Landoniæ.*" He completed his education at the university of Paris, where he took the degree of D.D. Bellenden is best remembered by his translation of Boece's *Scotorum Historiæ* (done in 1533), and of the first five books of Livy (also done in 1533), interesting as specimens of the Scottish prose of that period, and remarkable for the ease and vigor of their style. To both of these works are prefixed poetical *prohemes* or prologues. Bellenden's *Croniklis of Scotland* professes to be a translation of Boece, but it is a very free one, and contains numerous passages not to be found in the original, so that it is in some respects to be considered almost an original work. The author enjoyed great favor for a long time at the court of James, at whose request he executed the translations. As the reward of his performances, he received grants of considerable value from the treasury, and afterwards was made archdeacon of Moray and canon of Ross. Becoming involved, however, in ecclesiastical controversy, he left his country, and, according to Bale and Dempster, went to Rome, where he died about 1550. The translation or "traductioun" of Livy was first published in 1822 by Mr. Thomas Maitland (afterwards lord Dundrennan), uniform with his edition of the *Croniklis* in the previous year (Edin., 2 vols., 4to).

BELLENDEN, WILLIAM, a Scottish author in the time of queen Mary and James VI. His personal history is meager and obscure; all that we know being the testimony of Dempster (*Hist. Eccl.*) that he was a professor in the university, and an advocate in the parliament of Paris, and that he was employed in that city in a diplomatic capacity by queen Mary, and also by her son, who conferred on him the appointment of master of requests. His first work, entitled *Ciceronis Princeps*, etc., was published at Paris in 1608; his next, *Ciceronis Consul, Senator, Populusque, Romanus*, in 1612. Both these works are compilations from the writings of Cicero. His next work, *De Statu Prisci Orbis*, appeared in 1615, and consists of a condensed sketch of the history and progress of religion, government, and philosophy in ancient times. These three works he republished in a collected form the year after, under the title *De Statu, Libri tres*. His crowning labor, *De Tribus Luminibus Romanorum*, was published after his death. The "three luminaries" were Cicero, Seneca, and Pliny, out of whose works he intended to compile, on the same plan as his previous works, a comprehensive digest of the civil and religious history, and the moral and physical science of the Romans. The first of these only was completed, and forms a remarkable monument of B.'s industry and ability. "B.," says Mr. Hallam, "seems to have taken a more comprehensive view of history, and to have reflected more philosophically on it than perhaps any one had done before." B.'s works furnished the materials for Dr. Middleton's *Life of Cicero*, though that learned divine abstains from any allusion to the forgotten Scot from whom he plundered wholesale. Wharton first denounced the theft, which was afterwards made clear by Dr. Parr in his edition of *De Statu, Libri tres*, published in 1787.

BELLEROPHON, a genus of univalve shells, known only as a fossil. Montfort, who established the genus, placed it among the chambered cephalopoda. It was subsequently associated with the living argonaut, but is now generally considered as a genus of De Blainville's nucleobranchiata (q.v.), having as its nearest ally the genus *Atlanta;* from which, however, it differs in having a strong shell. The shell of the B. is symmetrically convolute, with few and occasionally sculptured whorls, globular or discoidal, and having a dorsal keel, which terminates in a deep notch in the sinuous aperture. It is a paleozoic organism, extending from the lower Silurian to the carboniferous series. Seventy species have been described.

BELLEROPHON (originally called HIPPONOUS) was the son of the Corinthian king Glaucus, and Eurymede, daughter of Sisyphus. Other accounts make Neptune his father. Having accidentally killed his brother, B. fled to his relative Prœtus, king of Argos, by whom he was hospitably received and protected; but Anteia, the spouse of Prœtus, having become enamored of him, and he, like Joseph, having declined her over-

tures, she revenged herself after the manner of Potiphar's wife. This induced Prœtus to send his guest away to Iobates, king of Lycia, to whom B. carried a sealed message. After being entertained nine days at the court of Lycia, B. delivered the letter, which contained a request that Iobates would cause the youth to be slain. This, however, Iobates was reluctant to do in a direct way, as B. was his guest. He consequently imposed upon B. the seemingly impossible task of slaying the formidable Chimæra (q.v.). B., mounted on the winged steed Pegasus (given to him by Pallas), ascended into the air, and succeeded in slaying the monster with his arrows. Afterwards, he was sent by king Iobates against the Amazons, whom he defeated. On his way home he destroyed an ambuscade of Lycians, which Iobates had set for his destruction. That monarch now thought it useless to attempt his death, and as a sort of recompense, gave the hero in marriage his daughter Philonoë, by whom he had three children—Isander, Hippolochus, and Laodameia; such at least is the story as told by Apollodorus, who here concludes. Homer relates that he at last drew on himself the hatred of the gods, and wandered about in a desolate condition through the Aleïan field. Pindar relates that B. on Pegasus endeavored to mount to Olympus, when the steed, maddened by Jove through the agency of a gadfly, threw his rider, who was stricken with blindness. B.'s adventures were a favorite subject of the ancient artists. Sculptures have recently been discovered in Lycia which represent him vanquishing the Chimæra.

BELLES-LETTRES, a term adopted from the French into the English and various other languages. It is generally used in a vague way to designate the more refined departments of literature, but has in fact no precise limits. In English usage it is synonymous with another vague expression, *polite literature*, including history, poetry, and the drama, fiction, essay, and criticism.

BELLEVILLE, a t. of France, in the department of the Seine, forming a suburb of Paris, and inclosed by the new fortifications. It has manufactories of cashmeres, varnished leather, articles of polished steel, chemical stuffs, etc. There are springs at B. which have supplied Paris with water from a very early date, and it has tea-gardens and other places of amusement much resorted to by the Parisians. Population over 70,000.

BELLEVILLE, chief t. of the co. of Hastings, Ontario, Canada, situated on the bay of Quinté, lake Ontario, and on the Grand Trunk railway of Canada, 48 m. w. from Kingston. It is a very thriving town. Here are several iron-foundries, manufactories, and saw-mills. Pop. '71, 7305.

BELLEVILLE, a city in St. Clair co., Ill., 14 m. e. of St. Louis, Mo., on the St. Louis, Belleville and Southern, and Illinois and St. Louis railroads; pop. '70, 8,146. It is in a productive region, on high ground; has a Roman Catholic academy; there are coal-mines in the vicinity. A large proportion of the population are Germans.

BELLEY, a t. of France in the department of Ain, is a place of great antiquity, and was at one time strongly fortified. The finest lithographing stones in France are procured here. Pop. '76, 4105.

BELL-FLOWER. See CAMPANULA.

BELLING, WILHELM SEBASTIAN VON, 1719–79; a Prussian soldier, who, with a small force, coped with the whole Swedish army. He was a maj.gen. in 1762, and lieut. gen. in 1776. He was one of the bravest of hussars, and a favorite of Frederick the great.

BELLINGHAM, RICHARD, 1592–1672; b. England, governor of Massachusetts, elected in 1641 by six majority over John Winthrop. He was chosen twice afterwards, 1654 and 1666, and held the office until his death. When quite old he married a second wife, performing the service himself, but, as the publication of the bans was irregular, he was prosecuted for violating the law, was tried before himself as judge, and by himself acquitted. His sister Anne was a victim to the Salem persecution of witches.

BEL'LINI, the name of a Venetian family which produced several remarkable painters. The earliest was JACOPO B., who d. in 1470. He was a pupil of the celebrated Gentile da Fabriano, and one of the first who painted in oil. His eldest son, GENTILE B., b. 1421, d. 1501, was distinguished as a portrait-painter, and also as a *medailleur*. Along with his brother, he was commissioned to decorate the council-chamber of the Venetian senate. Mohammed II., having by accident seen some of his works, invited Gentile to Constantinople, employed him to execute various historical works, and dismissed him laden with presents. The "Preaching of St. Mark" is his most famous achievement. His more celebrated brother, GIOVANNI B., b. 1422, d. 1512, was the founder of the older Venetian school of painting, and contributed greatly to its progress. His works are marked by naïveté, warmth, and intensity of coloring. His best works are altar-pieces. His picture of the "Infant Jesus" slumbering in the lap of the Madonna, and attended by angels, is full of beauty and lively expression. His "Holy Virgin," "Baptism of the Lord," and "Christ and the Woman of Samaria," are also much admired. Among his numerous pupils the most distinguished were Giorgione and Titian.

BELLI'NI, LORENZO, 1643–1703; a Florentine anatomist and physician, who studied medicine under Redi. He was professor of anatomy at Pisa, and in Florence was

physician to the grand duke Cosmo, and also senior consulting physician to pope Clement XI.

BELLI'NI, VINCENZO, one of the most popular modern opera composers, was b. at Catania, in Sicily, Nov. 1, 1802, and d. at Puteaux, near Paris, Sept. 24, 1835. He received his early education at the conservatory of Naples, and was subsequently instructed in composition by Tritto and Zingarelli. After making some attempts, without much success, in instrumental and sacred music, he brought forward, in 1825, the opera *Andelson e Salvina*, which was played in the small theater of the royal college of music (Naples). Another opera, *Bianco e Gernando*, was given in the theater St. Carlo (1826) with such success that, in 1827, B. was commissioned to write a piece for *La Scala* at Milan. This opera, *Il Pirata*, was the first which carried the composer's name beyond Italy. It was followed with equal success by *La Straniera*, 1829, and by *I Capuletti ed i Montecchi*, written for the theater of Venice, 1830, which was the culmination of the fame of B., though it by no means exhausted his productive powers. *La Sonnambula* and *Norma* appeared in 1831, and *Beatrice di Tenda* in 1833. In the same year the composer went to Paris, where he became acquainted with other forms of music beside the Italian. He was received with great applause in London, and after his return to Paris, wrote his opera *I Puritani*, which shows the influence of the French school of music, but without servile imitation. At an early age the career of B. was interrupted by death, before the composer had fully developed his powers. He was the most genial and original of all the followers of Rossini, and though inferior to his master in exuberance of fancy, is superior in carefulness and finish, especially in the due subordination of instrumental decorations to vocal melody. In private he was highly esteemed for the purity and affectionateness of his character.

BELLINZO'NA, or BELLENZ, a t. of Switzerland, in the canton of Tessin or Ticino, on the left bank of the river of that name, and the seat of the provincial government, alternately with Lugano and Locarno. It is guarded by three old castles, and completely commands the passage of the valley in which it is situated. In former times, it was considered a place of great military importance, and was the scene of frequent conflicts between the Italians and Swiss; the latter of whom finally made themselves masters of it about the beginning of the 16th century. As an entrepôt for the merchandise of Germany and Italy, it is now a place of considerable commercial importance, though the population is but small—(1870) 2501.

BELLIS. See DAISY.

BELLMAN, KARL MIKAEL, 1740–95; the great lyric poet of Sweden. Like Pope, he was a precocious rhymer, and at 17 published a book, a translation from the German. In 1760, appeared *The Moon*, a satirical poem, and from 1765 to 1780 he was writing his *Fredman's Epistles* and *Fredman's Songs*. The mode of composition of these works was surprising. In the presence of none but confidential friends, B. would take a zither, shut his eyes, announce that the god was about to visit him, and go on improvising an ode in praise of love or wine, singing it to a tune of his own construction. While the verses which he wrote in the usual way are tame and without character, the compositions made in this state of ecstasy glow with color, ring with melody, and bear the impress of individual genius. The odes of B. breathe a passionate love of life; he is amorous of existence, and keen after pleasure; but after all the frenzy there is a pathos, a yearning that is sadder than tears. He is sometimes frantic, sometimes gross, but always ready at his wildest moments to melt into tears. B. had a grand manner, a fine voice, and a great gift of mimicry. He was a favorite companion of king Gustavus III. Several statues of B. are in existence, the best being a colossal bust in the public gardens at Stockholm, erected by the Swedish academy.

BELL OF A CAPITAL is the capital of a pillar denuded of the foliage, in which case it resembles the form of a bell reversed.

BELLO'NA, the goddess of war among the Romans, was described by the poets as the companion, sister, wife, or daughter of Mars; she was also represented as armed with a bloody scourge, and as inspiring her votaries with a resistless enthusiasm in battle. In the war with the Samnites, the consul Appius Claudius vowed a temple to B., which was erected afterwards on the field of Mars. In this temple the senate gave audience to embassies from foreign powers, and also to consuls who had claims to a triumph which would have been nullified by entrance into the city. The priests of the goddess were styled *Bellonarii*, and practiced sanguinary rites: such as cutting their own arms or feet, and offering (or even drinking) the blood in sacrifice. This was especially done on the *dies sanguinis* (day of blood) Mar. 24.

BELLOT, JOSEPH RENÉ, a lieut. in the French navy, who perished in the arctic regions, in search of sir John Franklin, was b. in Paris, 18th Mar., 1826, and educated at Rochefort, in the naval school. In the French expedition against Tamatave, in 1845, he gave proof of so much courage and presence of mind, that the cross of the legion of honor was conferred on him before he had attained his twentieth year. In May, 1851, he joined the expedition then preparing in England for the polar regions, in search of sir John Franklin, and sailed in the *Prince Albert*, Kennedy commander, sent out by lady Franklin. Distinguished by his noble daring and spirit of enterprise, he took part

in several explorations. In one of these he made an important geographical discovery, to which his name was given—*Bellot strait* (q.v.). On his return, he was promoted to the rank of navy lieutenant. In the expedition fitted out by the British admiralty, under capt. Inglefield, he sailed as a volunteer, in H.M.S. *Phœnix;* but never returned, having been carried by a violent gust of wind, 21st Mar., 1853, into a deep crack in the ice on which he was traveling. A considerable sum was subscribed in England for a monument to his memory. His *Journal of a Voyage to the Polar Seas made in Search of Sir John Franklin* in 1851–52, edited, with a notice of his life, by M. Julien Lemer, 2 vols., was published at Paris in 1854. English translation, Lond., 1855.

BELLOT STRAIT, the passage which separates North Somerset from Boothia Felix, and connects Prince Regent's inlet with Peel strait or sound, or, in M'Clintock's new nomenclature, Franklin channel. Its e. entrance was discovered by Kennedy during his search for Franklin, and he, assuming the continuity of the opening, classified it accordingly, naming it after his lamented companion Bellot. After four unsuccessful attempts, it was explored for the first and perhaps last time by M'Clintock on his crowning voyage. It is about 20 m. long, and, at its narrowest part, about 1 m. wide, running pretty nearly on the parallel of 72°, between granite shores which, everywhere high, rise here and there to 1500 or 1600 feet. Through this funnel both the winds and the waters have full play; the latter, permanent currents and flood-tides alike, coming from the west. To the most northerly point on the s. shore, M'Clintock has given the name of Murchison promontory, which, at least unless other straits like B. S. be found towards the isthmus of Boothia, must be also the most northerly point of the new continent. See Barrow, Point.

BELLOY, Pierre Laurent Buirette, one of the first French dramatists who ventured to introduce on the stage native, instead of Greek, Roman, or other outlandish heroes. He was b. at St. Flour, in Auvergne, 17th Nov., 1727, and d. 5th Mar., 1775. His father having died while B. was young, his uncle took him under his protection, and educated him for the law; but the seductions of the drama proved irresistible, and the opposition which he encountered in the cultivation of his theatrical talent ultimately determined him to leave his adopted home. Under the name of Dormont de B., he performed on various northern boards, and was much esteemed for his private worth. For some years he resided at St. Petersburg, where the empress Elizabeth interested herself in him. In 1758, he returned to France, to superintend the "bringing out" of his tragedy *Titus*, trusting that its success would reconcile his family to him. In this, however, he was disappointed, for the piece proved a failure, being only a feeble imitation of *Metastasio*, and he returned to St. Petersburg. After the death of his uncle, he again visited France, and obtained a decided success by his tragedy of *Zelmire*. In 1765 appeared *Le Siége de Calais*, which was immensely popular, and is even yet held in estimation; and in 1771, *Gaston and Bayard*, which secured for him an entrance to the French academy. But of all his productions, the one which has longest retained a place in the *répertoire* of the stage, though it was far from popular at first, is *Pierre le Cruel*. B.'s dramas are not by any means wanting in theatrical effectiveness, but are marred by great incorrectness. They have been collected and edited by Gaillard (6 vols., Par., 1779).

BELLOWS. See Blowing-machines.

BELLOWS, Henry Whitney, s.t.d., ll.d., b. Mass., 1814; a graduate of Harvard, and of Cambridge divinity school; in 1838, pastor of the first Congregational (Unitarian) church of New York, and still officiating there in 1880. Dr. B. was instrumental in establishing the *Christian Enquirer* in 1846. He has published a number of lectures and pamphlets, among the more notable his *Phi Beta Kappa Oration*, a *Defense of the Drama*, *Treatment of Social Diseases*, *Christian Doctrine*, *The Old World in its New Face*, etc. With an excellent literary taste and skill he combines practical and administrative ability. He did excellent service as presiding officer of the sanitary commission during the war of the rebellion.

BELLOWS FALLS, a village in Vermont, on the Central Vermont and Cheshire railroads, and on the Connecticut river, 52 m. s.s.e. of Rutland. There is a bridge across the river, and the village is noted for manufactures. The water-power is supplied by the falls, which with several rapids have a descent of 44 feet. These falls were the subject of absurd exaggeration by Samuel Andrew Peters, the tory clergyman of the church of England who wrote the notorious history of Connecticut. Pop. '80, 2228.

BELLOWS FISH, or Trumpet Fish, *Centriscus scolopax*, found in the Mediterranean; it is spiny-rayed, of the tufted-gilled order, with a tubular snout and small mouth without teeth at the end; body oval; spinous dorsal fins; ventrals united. It feeds by suction on minute crustacea. Its flesh is considered palatable.

BELL ROCK, or Inch Cape, a reef of old red sandstone rocks in the German ocean, 12 m. s.e. of Arbroath, and nearly opposite the mouth of the Tay. The reef is 2000 ft. long; at spring-tides, part of it is uncovered to the height of 4 ft.; and for 100 yards around, the sea is only 3 fathoms deep. It was formerly a fruitful cause of shipwreck, and, according to tradition, the abbot of Aberbrothwick (Arbroath) placed a bell on it, "fixed upon a tree or timber, which rang continually, being moved by the sea, giving notice to the saylers of the danger." This tradition has been embodied by Southey in

his well-known ballad of *The Inchcape Rock*. A light-house, designed by Robert Stevenson, engineer to the commissioners of northern light-houses, was commenced in 1807, and completed on the reef in 1811, and a revolving red and white light exhibited. The structure is 115 ft. high, is 42 ft. in diameter at base, and 15 at top, is solid for the first 30 ft. upwards, 15 ft. of which is under water at high tide, and cost upwards of £60,000.

BELLS, on shipboard, is a term having a peculiar meaning, not exactly equivalent to, but serving as a substitute for "time" or "o'clock" in ordinary land-life. The day, or rather the night, is divided into watches or periods, usually of four hours' duration each; and each half-hour is marked by striking on a bell. The number of strokes depends, not on the hour, according to ordinary reckoning, but on the number of half-hours which have elapsed in that particular watch. Thus, "three bells" is a phrase denoting that three half-hours have elapsed, but it does not in itself show to which particular watch it refers. Capt. Basil Hall, in his *Fragments of Voyages and Travels*, while treating of Sunday usages on board ships of the royal navy, mentions one or two phrases illustrative of this mode of time-reckoning. While the sailors are at breakfast on Sunday morning, "the word is passed to 'clean for muster,' and the dress is specified according to the season of the year and climate. Thus, at different seasons is heard: 'Do you hear there, fore and aft! clean for muster at five bells! duck-frocks and white trousers!'—or, 'Do you hear there, clean shirt and a shave for muster at five bells!'" A ship's bell is usually hung to the beam of the forecastle, but occasionally to a beam near the mizzen-mast. Sometimes, in foggy weather, as a warning to other ships, the bell is struck to denote that the ship is on a starboard-tack; leaving the port-tack to be denoted by the beat of a drum. See WATCH ON SHIPBOARD.

BELLU'NO (the ancient *Bellunum*), a city of Venetia, northern Italy, on the right bank of the Piave, and 51 m. n. of the city of Venice. It is walled, is the seat of a bishop, has a handsome cathedral, hospital, public library, fine aqueduct, etc. It has a trade in timber, and manufactories of silks, hats, leather, and earthenware. Pop. 7000.

BELLUR', a large t. in the territory of Mysore, India, 40 m. n. from Seringapatam, with a fort, which has a strong mud rampart and ditch. The town itself was formerly protected by a similar rampart, which is now ruinous.—Another town of the same name, also in Mysore, is situated 60 m. w.n.w. from this, a mile from the w. bank of the river Yagachi, or Bhadri, one of the head-waters of the Cavery.

BEL-MERODACH. See MERODACH.

BELMONT, a co. in e. Ohio, on the West Virginia border; intersected by a branch of the Cleveland and Pittsburgh, and the Baltimore and Ohio railroads; 525 sq.m.; pop. '70, 39,714; in '80, 50,014. The surface is hilly; soil good, producing grain, tobacco, potatoes, sorghum, dairy products, and wool. Bituminous coal is found. Cc. seat, St. Clairsville.

BELMONT, a village in Missouri, on the Mississippi river, opposite Columbus, Ky. Here, Nov., 1861, a sharp conflict for possession of the place occurred between the union forces under gen. Grant, and the confederates under gen. Pillow. As B. was commanded by the guns of gen. Polk at Columbus, gen. Grant could not hold it, and fell back on his boats. Eighty-four union men and about as many confederates were killed.

BELOIT, a city of Wisconsin, U. S., on Rock river, on the Southern State railway, 75 m. s.w. of Milwaukee, built on two plains, one 70 ft. above the other, with broad shaded streets, groves, and handsome residences. It has a college, 9 fine churches, several flour and paper mills, foundries, and manufactories of agricultural implements, etc. Pop. '70, 4396.

BELOIT COLLEGE, at Beloit, Wis.; was organized in 1847, under Congregational and Presbyterian patronage. It has an endowment of $140,000, and an annual income of $15,000. The buildings are six in number, including chapel, memorial hall, and gymnasium, standing within a campus of 24 acres, on the Rock river. The laboratory and apparatus are valued at $3000; the geological and mineral cabinet at $2500. The library contains about 10,000 volumes. The number of professors (1880) is 8; other instructors, 2; students, 140; alumni, 272. Connected with the college and under the care of the faculty are collegiate, classical, philosophical, scientific, preparatory, and miscellaneous departments. Gymnastic exercises are maintained daily. The president is Aaron L. Chapin, D.D.

BEL'OMANCY (Gr. *belos*, an arrow; *manteia*, prophecy), a mode of divination by arrows, practiced among the Arabs and other nations of the east. A number of arrows being shot off with sentences written on labels attached to them, an indication of futurity is sought from the inscription on the first arrow found. This is only one of many ways of divining by arrows. See AXINOMANCY, DIVINING-ROD.

BELON, PIERRE, a celebrated French naturalist, was b. in 1517 at Soulletière, in the department of Sarthe. He studied medicine at Paris, and subsequently traveled through Germany. In 1546, he left France, and visited Greece, Asia Minor, Egypt, and Arabia. He returned in 1549, and in 1553 published the results of his travels, in a work entitled *Observations on several Singular and Memorable Things discovered in Greece, Asia, Judea,*

Egypt, Arabia, and other Foreign Countries. Charles IX. gave him apartments in the Château of Madrid, a sumptuous edifice which Francis I. had constructed in the Bois de Boulogne. Here he resided till his tragic death in April, 1564. He was murdered by robbers when gathering herbs at a late hour in the evening in the Bois de Boulogne.

Besides the valuable work already mentioned, B. published, in 1551, *A Natural History of Strange Sea-fish, with a correct Representation and Account of the Dolphin, and several others of that Species*, which contains, among other things, an exact description of the dolphin, and the earliest picture of a hippopotamus in any European book; in 1555, *A Natural History of Birds*, which is often quoted by Buffon, and acknowledged to be the most important treatise on ornithology of the 16th c.; in 1558, an elaborate and interesting work on arboriculture, in which he gave a list of the exotic trees which it would be useful to introduce into France. Besides these, B. wrote several other treatises of trees, herbs, birds, and fishes.

BEL'ONE. See GARFISH.

BELOOCHISTAN', or BALUCHISTAN, a country of southern Asia, bounded on the n. by Afghanistan, on the e. by Sinde, on the s. by the Arabian sea, and on the w. by the Persian province of Kerman. B. corresponds in general with the ancient Gedrosia, excepting that the latter name appears to have extended to the Indus, while the former nowhere reaches that river. B. stretches in n. lat. between 24° 50′ and 30° 20′, and in e. long. between 61° and 68° 40′, having a coast-line of 500 miles. The area is about 106,000 sq.m., and the population is variously estimated at from 400,000 to 1,000,000. Though it was anciently a part of Persia, yet its modern relations connect it rather with India, more particularly since Sinde and Moultan have fallen under the dominion of the English. In the bygone ages of the overland invasions of Hindustan, the Gedrosian or Beloochee desert formed, as it were, a barrier for the lower Indus, constraining every assailant, from Alexander downwards, to prefer the less barren, though perhaps more rugged route through Afghanistan into the Punjab—a preference strengthened by Alexander's direful experience in returning from the Indus along the coast. The surface is generally mountainous, more especially towards the n., the peak of Takkatu being said to be 11,000 ft. high. Even the bottoms of some of the valleys have an elevation of 5700 ft.; and the capital, Kelat, situated on the side of one of them, is 6000 ft. above the level of the sea. The rivers are inconsiderable, unless after heavy rains: even the largest of them, the Dusti, after a course of about 1000 m., has been found to be only 20 in. deep, and 20 yds. wide at its mouth. The pastures, as may be supposed, are poor, so that there are few cattle: sheep and goats, however, are numerous. The dromedary is the ordinary beast of burden, and it is only in the n.w., towards Kerman, that horses are bred. Wherever there is a sufficiency of water, the soil is productive—the lowlands yielding rice, sugar, cotton, indigo, and tobacco; and the higher grounds, wheat, barley, madder, pulse, and European fruits. In the sandy waste of Mekran, where Alexander's army suffered its severest hardships and privations, the only valuable product is the date. The minerals are copper, lead, antimony, iron, sulphur, alum, and sal-ammoniac; and the manufactures are skins, woolens, carpets, and tent-covers of goat's and camel's hair, and rude fire-arms. B. has but one seaport, Sonmeanee, near the frontier of Sinde. The trade is insignificant, being, such as it is, chiefly monopolized by Hindus. The chief peoples of B. are the distinct races of the Belooches and the Brahoes; all the inhabitants are Mohammedans of the Sunnite confession. Most of the e. provinces, which alone come into contact with British India, are under the authority of the khan of Kelat, who, with a revenue of about £30,000, maintains an army of 3000 men. This petty sovereign having acted treacherously towards the British during the Afghan campaign of 1839, his royal city was taken by storm in the same year. In 1840, it was abandoned; but, in 1841, it was again captured, for temporary occupation, by the British.

BELPAS'SO, a t. of Sicily, on the lower part of the southern slope of Mt. Etna, in the province and 8 m. n.w. from the town of Catania. Pop. about 7500. Below the town is an expanse of brown lava, but the surrounding country is generally rich and fruitful. A town called Mel Passo, from the abundance of honey in its neighborhood, stood not far from the site of the present town, but was destroyed by an eruption in 1669; when the inhabitants removed to a locality a few miles off, in the plain, and built a town of which the desolate remains are still to be seen, bearing the name of *Belpasso Vecchio;* malaria compelled them to leave it, and to return to the mountain-slope, notwithstanding its occasional dangers.

BELPER, a market t. of Derbyshire, England, on the Derwent; a station on the North Midland railway, 7 m. n. from Derby. It is well built, in great part of grit-stone, which is obtained in the neighborhood. One of the most conspicuous public buildings is a church, of recent erection, on an eminence above the town; the union workhouse is also worthy of notice, being a splendid building in the Elizabethan style of architecture. B. is, to a considerable extent, a town of recent growth, and owes its prosperity to the establishment of cotton-works here by Messrs. Strutt, one of whom was elevated to the peerage as lord Belper. In these works, a very great number of operatives are employed. The manufacture of silk and cotton hosiery is also largely carried on in Belper. Nail-making and the manufacture of brown earthenware also give employment to many of

the inhabitants. The surrounding country is rich in coal, iron, lead, and limestone. B. was at one time the residence of John of Gaunt, part of whose mansion still remains. Pop. '71, 8527.

BELSHAM, THOMAS, one of the ablest expounders of the Unitarian system of theology, was b. at Bedford in 1750. He was educated in the principles of Calvinism, and for some years officiated as pastor of the dissenting congregation and head of the theological academy at Daventry. These offices he resigned in 1789, on embracing Unitarian views, and shortly after received the charge of a new theological academy at Hackney, which in a few years collapsed for want of funds. Before its extinction, he succeeded Dr. Priestley in his pastoral charge, and in 1805 removed to London as the successor of Dr. Disney, where he continued till his death in 1829. Most of his works are controversial: his doctrine regarding the person of Christ represents the purely "humanitarian" view, as distinguished from the more nearly Arian sentiments of men like Channing. He published also a work on mental and moral philosophy, following Hartley, and a memoir of his predecessor, Theophilus Lindsey. His brother, William (b. 1752; d. 1827), was an active and voluminous writer of history and political tracts on the side of the Whigs.

BELSHAZ'ZAR, or BELSA'ZAR, was the last king of the Chaldean dynasty in Babylon. The name occurs only in the Old Testament, where it indicates either the person who is called by Herodotus Labynetos, or his son. For an account of the circumstances attending his overthrow, see the book of Daniel, Herodotus, etc.

BELSHAZZAR (*ante*). In regard to the supposed discrepancies between the Bible and such writers as Berosus and Herodotus, sir Henry Rawlinson has recently shown that those writers not only do not contradict, but explain and confirm the account given in the Scriptures. It appears that the eldest son of Nabonedus was Bel-shar-ezar, and was by his father admitted to a share in the government. Sir Henry says "we can now understand how Belshazzar may have been king in Babylon when the city was attacked by the combined forces of the Medes and Persians, and may have perished in the assault which followed, while Nabonedus, leading a force to the relief of the place, was defeated and obliged to take refuge in Borsippa, capitulating after a short resistance, and being subsequently assigned, according to Berosus, an honorable retirement in Carmania."

BELT (signifying Girdle), the name given to two straits, the GREAT and the LITTLE B., which, with the Sound, connect the Baltic with the Cattegat. The GREAT B., about 70 m. in length, and varying in breadth from 4 to more than 20 m., divides the Danish islands, Seeland and Laaland, from Fünen and Langeland. The LITTLE B. divides the island of Fünen from Jütland. It is equal in length to the Great B., but much narrower. Its greatest breadth is about 10 m., but it gradually narrows toward the n., until at the fort of Frederica it is less than a mile wide; thus the passage from the Cattegat into the Baltic is here easily commanded. Both the Belts are dangerous to navigation, on account of numerous sandbanks and strong currents; and therefore, for large vessels, the passage by the Sound (q.v.) is preferred.

BEL'TEIN, BEL'TANE, BEIL'TINE, or BEAL'TAINN, the name of a heathen festival once common to all the Celtic nations, and traces of which have survived to the present day. The name is derived from *tin* or *teine*, fire, and Beal or Beil, the Celtic god of light or sun-god, a deity mentioned by Ausonius (309–92 A.D.) and Tertullian (who flourished during the first half of the 3d c.), as well as on several ancient inscriptions, as Belenus or Belinus. B. thus means "Beal's fire," and belongs to that sun and fire worship which has always been one of the most prominent forms of polytheism. The great festival of this worship among the Celtic nations was held in the beginning of May, but there seems to have been a somewhat similar observance in the beginning of November (the beginning, and the end of summer). On such occasions, all the fires in the district were extinguished (while the system was in full force, even death was the penalty of neglect); the *needfire* (q.v.) was then kindled with great solemnity, and sacrifices were offered—latterly, perhaps, of animals, but originally, there can be little doubt, of human beings. From this sacrificial fire the domestic hearths were rekindled.

The earliest mention of B. is found by Cormac, archbishop of Cashel in the beginning of the 10th century. A relic of this festival, as practiced in some parts of the highlands of Scotland about the beginning of the 19th c., is thus described: "The young folks of a hamlet meet in the moors on the 1st of May. They cut a table in the green sod, of a round figure, by cutting a trench in the ground of such circumference as to hold the whole company. They then kindle a fire, and dress a repast of eggs and milk in the consistence of a custard. They knead a cake of oatmeal, which is toasted at the embers against a stone. After the custard is eaten up, they divide the cake in so many portions, as similar as possible to one another in size and shape, as there are persons in the company. They daub one of these portions with charcoal until it is perfectly black. They then put all the bits of the cake into a bonnet, and every one, blindfold, draws out a portion. The bonnet-holder is entitled to the last bit. Whoever draws the black bit is the devoted person, who is to be sacrificed to Baal, whose favor they mean to implore in rendering the year productive. The devoted person is compelled to leap three times over the flames." The leaping three times through

the fire is clearly a symbolical sacrifice, and there was doubtless a time when the victim was bound on the pile, and burned. See SACRIFICE.

It has been usual to identify the worship of the Celtic Beal with that of the Baal (q.v.) or Bel of the Phenicians and other Semitic nations. It is unnecessary, however, to go beyond the family of nations to which the Celts belong (see ARYANS), in order to find analogies either for the name or the thing. J. Grimm (*Deutsche Mythologie*, i. 208, 581) identifies the Celtic Beal not only with the Slavonic *Belbog* or *Bjelbog* (in which name the syllable *bel* or *bjel* means white, and *bog*, god), but also with the Scandinavian and Teutonic Balder (q.v.) or Paltar, whose name appears under the form of Baldag (the white or bright day), and who appears to have been also extensively worshiped under the name of Phol or Pol. The universality all over Europe in heathen times of the worship of these personifications of the sun and of light through the kindling of fires and other rites, is testified by the yet surviving practice of periodically lighting *bonfires* (q.v.). The more marked turning-points of the seasons would naturally determine the times of these festivals. The two solstices at midwinter (see YULE) and midsummer, and the beginning and end of summer, would be among the chief seasons. The periods of observance, which varied, no doubt, originally, more or less in different places, were still further disturbed by the introduction of Christianity. Unable to extirpate these rites, the church sought to Christianize them by associating them with rites of her own, and for this purpose either appointed a church-festival at the time of the heathen one, or endeavored to shift the time of the heathen observance to that of an already fixed church-festival. All over the s. of Germany, the great bonfire celebration was held at midsummer (*Johannisfeuer*), [see JOHN'S, EVE OF ST.]—a relic, probably, of the sun-festival of the summer solstice: throughout the n. of Germany, it was held at Easter. It is probable that this fire-festival (*Osterfeuer*) of Ostara—a principal deity among the Saxons and Angles—had been originally held on the 1st of May, and was shifted so as to coincide with the church-festival now known as Easter (q.v.; see also WALPURGA, ST.). The seriousness and enthusiasm with which these observances continued to be celebrated in the 16th and 17th c., began afterwards to decline, and the kindling of bonfires has been mostly put down by the governments; the earlier interdicts alleging the unchristian nature of the rites; the later, the danger occasioned to the forests.

In Great Britain, St. John's eve was celebrated with bonfires; and Easter had its fire-rites, which, although incorporated in the service of the Roman Catholic church, were clearly of heathen origin. But the great day for bonfires in the British islands was the 1st of Nov. Fewer traces of this are found in other countries, and therefore we must look upon it as more peculiarly Celtic. While the May festival of B. was in honor of the sun-god in his character of god of war—who had just put to flight the forces of cold and darkness—the Nov. festival was to celebrate his beneficent influence in producing the fruits which had just been gathered in. Hence it was called *Samhtheine* (peace-fire). If we may judge from the traces that still remain or have been recorded, the Nov. observances were more of a private nature, every house having its bonfire and its offerings, probably of fruits, concluding with a domestic feast. The B. festival, again, was public, and attended by bloody sacrifices. Although the Nov. bonfires, like B., were probably of Celtic origin, they seem to have been adopted by the inhabitants of the British islands generally. About the end of last century they were still kindled in various parts of England, and to this day, over whole districts of Aberdeenshire, every rural dwelling has its hallow-e'en bonfire lighted at nightfall in an adjoining stubble-field.

The Anglo-Saxon population of England had their own characteristic May-day rites; but there exist traces also of the observance among them on that day of rites similar to the Celtic beltane. An "Old Holne Curate," writing to *Notes and Queries* in 1853, says: "At the village of Holne, situated on one of the spurs of Dartmoor, is a field of about two acres, the property of the parish, and called the ploy (play) field. In the center of this stands a granite pillar (Menhir) 6 or 7 ft. high. On May morning, before daybreak, the young men of the village assemble there, and then proceed to the moor, where they select a ram lamb (doubtless with the consent of the owner), and after running it down, bring it in triumph to the ploy field, fasten it to the pillar, cut its throat, and then roast it whole, skin, wool, etc. At mid-day, a struggle takes place, at the risk of cut hands, for a slice, it being supposed to confer luck for the ensuing year on the fortunate devourer. As an act of gallantry, in high esteem among the females, the young men sometimes fight their way through the crowd to get a slice for their chosen among the young women, all of whom, in their best dresses, attend the *ram feast*, as it is called. Dancing, wrestling, and other games, assisted by copious libations of cider during the afternoon, prolong the festivities till midnight.

"The time, the place (looking e.), the mystic pillar, and the ram, surely bear some evidence in favor of the ram feast being a sacrifice to Baal."

Additional notices of this sun and fire worship will be found under YULE, CANDLEMAS, LAMMAS, and the other heads referred to in this article.

BELTRA'MI, a co. in s.w. Minnesota, very little settled. It has several lakes, one of which, Itasca, is 1600 ft. above sea level. Some of its lakes empty into the Red river of the n., which carries their waters to the ocean through Hudson's bay and straits, while others are emptied by the Mississippi into the gulf of Mexico.

BELTS, endless strips of flexible material, usually leather or india rubber, to transmit motion or power from one pulley to another. Ropes and chains serve a similar purpose. When chains are used, the pulleys are provided with projections which engage in the links of the chains and prevent slipping, and the mechanism has the positive relations of a rack and pinion. Ordinary flexible belts transmit power by the friction between them and their pulleys. The pulley which communicates motion is the driving pulley; that which receives, the driven pulley; that part of the belt which runs from the driven pulley to the driver is the driving part of the belt, since it is pulled by the driver, and in turn pulls on the driven pulley; the part of the belt which runs from the driver to the driven pulley is the slack belt. The strain on the driving belt is the sum of the strain of the belt on the pulleys when there is no motion, plus the strain of the friction; that on the slack belt is the same strain on the pulleys less the friction. Thus, if a belt is stretched over its pulleys with a strain of 10 lbs. per in. of width, and it requires 5 lbs. to make it slip, then the strain on the driving belt is 10 + 5=15 lbs., and the strain on the slack belt is 10—5=5 lbs., per in. of belt. As the two parts of the belt are unequally strained there will be a tendency to move, or *creep*, towards the driving belt over the driven pulley. Hence, the velocity ratio of the two pulleys will not exactly follow the inverse ratio of their radii, and the belt cannot be relied upon for giving uniformity of motion. For driving most machinery, the fact that the belt is elastic, and will slip if unduly strained, makes it a favorite method of communicating power. Rubber belts transmit about 25 per cent more power than leather, because the surface of the rubber conforms more perfectly to the minute inequalities of the pulley surface, and thus acquires a closer grasp. The texture of a rubber belt is more uniform than can be had in leather, and therefore a wide rubber belt will wear more evenly. In damp and exposed places, rubber is more durable than leather. If, however, the belt is to be shifted back and forth, as in the stopping and starting of many machines, or in cross belting—wherever the edge of the belt is liable to wear—leather is preferable. If the pulley be higher at the center than at the side, or higher at one side than at the other, the belt will creep towards the highest part; for this reason the surface of the pulley is usually made not cylindric, but of greater diameter at the center. If this be overdone, the belt does not pull, except along its central part. The pulleys usually lie in the same plane, and with their axes parallel; but this is not necessary, provided that the course of each part of the belt—the driving and the slack part alike—be in the plane of the pulley toward which that part of the belt runs; the belt being always delivered by one pulley into the plane of the other.

Transmission of power by B. is more common in the United States than in Europe. As extreme cases may be noted: a leather belt of the New Jersey zinc works, 4 thicknesses, 48 in. wide and 102 ft. long; a rubber belt in Chicago, 6 ply, 48 in. wide and 320 ft. long; a leather belt for a paper mill in Wilmington, Del., 60 in. wide and 186½ ft. long. Hempen or wire ropes, running over large pulleys with V shaped edges, are used to transmit power to long distances. The U. S. arsenal at Rock Island, Ill., carries more than half a mile by one rope the power of 4 large turbine wheels, sufficient for all the present need of the machine shops. Such cables have been called teleodynamic cables. They can be run as fast as one mile per minute, and without covering will last three years. Intermediate sheaves are required at every 300 or 400 feet. For information concerning the length of B. and the power transmitted, see RANKINE, MACHINERY AND MILL WORK, etc.

BELU'GA, a genus of *cetacea* (q.v.), of the family of *delphinidæ* or dolphins (q.v.), differing from the rest of that family in the blunt and broad head, which has no produced snout; the smaller number of teeth, the greater part of which often fall out before the animal is far advanced in age; and the want of a dorsal fin. The only species found in the northern parts of the world is *B. arctica* (for which name there are unhappily many synonyms, as *B. leucas*, etc.), the white whale and white fish of whalers, often called by English writers the B., and the round-headed cachalot. The form of the B. is remarkably characterized by the softness of all its curves, and adapts it for rapid and graceful movements; its skin is usually of a clear white color, and not very strong, so that it often fails to hold a harpoon. The B. attains a length of more than thirteen ft. The female brings forth two young ones at a birth, and displays the greatest solicitude for them. The food of the B. consists of fish, in pursuit of which it often ascends rivers to some distance. It is gregarious, and may be seen in herds of forty or fifty, which often gambol around boats; it abounds in most parts of the arctic seas, and sometimes, but not very frequently, visits the British shores. One was killed in the Firth of Forth in 1815, and one in the Medway in 1846. The Greenlanders take the B. with harpoons or with strong nets. Its flesh affords them a valuable supply of food, and is eaten by most of the inhabitants of arctic coasts; it affords also a considerable quantity of the very finest oil, and the skin is made into leather. Some of the internal membranes are also employed for various purposes.—Another species of B. is found in the southern hemisphere. It is called *B. Kingii*.

BE'LUS. See BAAL.

BELVEDERE' (It.) was originally an erection on the top of a house, for the purpose of looking out on the surrounding country, and enjoying the air, in which sense it is

still understood in Italy. A part of the Vatican (q.v.) in Rome is known as the B., and gives name to the famous statue of Apollo. In France, and with us, the word has come to signify any kind of summer-house or place of refreshment.

BELVEDERE', *Kochia scoparia, Chenopodium scoparium*, or *Salsola scoparia*, an annual plant of the natural order *Chenopodiaceæ* (q.v.), a native of the middle and s. of Europe, and of great part of Asia, which has long been very familiar in British gardens as an ornamental annual, not upon account of its flowers, which have no beauty, but of its close, pyramidal, rigid form, and numerous narrow leaves, which make it appear like a miniature cypress tree. It is sometimes called SUMMER CYPRESS.

BELVIDERE', chief t. in Boone co., Ill., 78 m. w. of Chicago, on the Chicago and Northwestern railroad; pop. '70, 3231. There are flouring mills and other manufactories.

BELVI'SIA (also called NAPOLEO'NA), a genus of exogenous plants, the type of the natural order *Belvisiaceæ*, of which order only a very few species have yet been discovered, natives of the tropical parts of Africa. They are large shrubs, with smooth, simple, leathery leaves. The flowers grow in threes, sessile in the axils of the leaves, and are beautiful and extremely curious. The calyx is a thick, leathery cup, divided into five ovate segments. The corolla consists of three distinct rings; the outer one 5-lobed, and furnished with ribs, by means of which it is strongly plaited, turning back over and hiding the calyx when full blown; the second, a narrow membrane, divided into numerous regular segments like a fringe; the third, an erect cup-shaped membrane. The stamens are erect like another cup; the ovary 5-celled, with two ovules in each cell; the style short, thick, and 5-angled, with a broad, flat, 5-angled stigma. The fruit is a soft berry, crowned with the calyx, with large kidney-shaped seeds. The wood is soft, and contains numerous dotted vessels.—The pulp of the fruit of the best known species is mucilaginous and eatable, the rind very full of tannin; the fruit is as large as a pomegranate, and the seeds 1¼ in. long.—The position of this remarkable order in the botanical system is not yet well determined. Lindley regards it as most nearly allied to *rhizophoraceæ* (Mangroves, q.v.). It is supposed by some that the two inner rings of the corolla should be regarded as sterile stamens, and the place of the order is thus fixed near *Barringtoniaceæ* (q.v.)

BELZO'NI, GIOVANNI BATTISTA, the son of a poor barber, was b. at Padua in 1778, and was educated at Rome, for the priesthood, but soon displayed a preference for mechanical science, especially hydraulics; and when the French republican troops took possession of the pontifical city, he quitted his religious studies altogether. About the year 1800, he visited Holland, and in 1803 came to England. For a time he gained a living by exhibiting feats of strength in the theaters. At Astley's, he played the part of Hercules, but he also continued his mechanical studies, and even gave numerous hydraulic representations in the most populous towns of the kingdom. After a sojourn of nine years in England, he went to Spain and Portugal, in his capacity of theatrical athlete. From the peninsula, he passed to Malta, and thence to Egypt in 1815, on the invitation of Mehemet Ali, who wished him to construct a hydraulic machine. After succeeding in this undertaking, he was induced, by the travelers Burckhardt and Salt, to direct his attention to the exploration of Egyptian antiquities. He threw himself with ardor into his new vocation. He removed the colossal bust of the so-called "Young Memnon" from the neighborhood of Thebes to Alexandria, and was the first who opened the temple of Ipsambul. In the valley of "the royal graves"—Biban-el-Moluk—near Thebes, he discovered several important catacombs containing mummies, and among others, opened, in 1817, the celebrated tomb of Psammetichus, from which he removed the splendid sarcophagus, now, along with the "Young Memnon," and other results of B.'s labors, in the British museum. But B.'s greatest undertaking was his opening of the pyramid of Cephren. An attempt made on his life caused his departure from Egypt, but previously he made a journey along the coast of the Red sea, and another to the oasis of Siwah, hoping there to find ruins of the temple of Jupiter-Ammon. In the course of his explorations, he discovered the emerald mines of Zubara and the ruins of Berenice, the ancient commercial entrepôt between Europe and India. In Sept., 1819, he returned to Europe, visited his native town, Padua, and enriched it with two Egyptian statues of granite. He also published in London his *Narrative of the Operations and Recent Discoveries within the Pyramids, Temples, Tombs, and Excavations in Egypt and Nubia; and of a Journey to the Coast of the Red Sea in search of the ancient Berenice, and another to the Oasis of Jupiter-Ammon* (1821, with an atlas of 44 colored engravings). In 1821 he opened in London an exhibition of his Egyptian antiquities, but soon afterwards undertook a journey to Timbuctoo, in central Africa. At Benin, he was attacked by dysentery, which compelled him to return to Gato, where he died, Dec. 3, 1823. His original drawings of the royal tombs he had opened in Egypt were published by his widow (London, 1829).

BEM, JOSEPH, commander of the army in Transylvania during the Hungarian revolution, 1848–49, was b. at Tarnov, in Galicia, 1795. After a course of military adventure in Poland, he went to France, where he resided for a considerable time, earning a livelihood by teaching mechanics and mnemonics. In 1848 after failing in an attempt to

organize an insurrection in Vienna, he joined the Hungarians, and was intrusted with the command of the army of Transylvania, amounting to 8000 to 10,000 men. He at first experienced some checks from the Austrian army, but afterwards defeated them at Hermannstadt and the bridge of Piski; and finally succeeded, in Mar., 1849, in driving both them and their allies, the Russians, back into Wallachia. Having thus made himself master of Transylvania, he proposed, by amnesties and general mild rule, to gain the adherence of the German and Slavonian population, especially in Wallachia; but his propositions were not entertained by Kossuth and the Hungarian commissariat. After expelling the troops under Puchner from the Banat, B. returned into Transylvania, where the Russians had defeated the Hungarians. Here he reorganized his forces, and did all that was possible in his circumstances to prevent the union of the Russians with the Austrians, but his efforts were unsuccessful. After failing in an attempt to excite an insurrection in Moldavia, he was defeated in a battle near Schäszburg, where he was opposed to three times the number of his own troops. At Kossuth's request, he now hastened into Hungary, where he took part in the unfortunate battle near Temesvar. Retreating into Transylvania, he here defended himself for some days against a vastly superior force, and then made his escape into Turkey, where he embraced, from political motives, the profession of Islam, was raised to the dignity of a pasha, and obtained a command in the Turkish army. In Feb., 1850, he was sent to Aleppo, where, after suppressing the sanguinary insurrection of the Arabs against the Christian population, he died of fever, Dec. 10, 1850. B. was in private life characterized by the benevolence of his disposition, and, as a military leader, was distinguished by courage, presence of mind when in extreme danger, and remarkable rapidity of movement.

BEMAN, NATHANIEL S. S., D.D., 1785–1871; b. N. Y.; graduate of Middlebury college; studied for the ministry, and was pastor of a Congregational church in Portland, Me. About 1813 he was a missionary in Georgia, where he labored to establish better education. In 1822, he became pastor of the First Presbyterian church in Troy, N. Y., where he officiated more than 40 years, during which period he was prominent in the moral and political questions of the time. He was moderator of the Presbyterian general assembly in 1831, and in 1837 he was a leader of the New School section. He resigned his pastoral charge in 1863. Some of his addresses and sermons have been published, in a volume. He also published *Four Sermons on the Atonement.*

BEMBATOO'KA, BAY OF, a safe and commodious bay on the n.w. coast of Madagascar, in lat. 16° s., and long. 46° e. Prime bullocks are sold here for less than 10*s.* each, and are bought extensively by agents of the French government, who have them driven to fort Dauphin, on Antongil bay, on the opposite side of the island, where they are killed and cured for the use of the French navy, and for colonial consumption. Rice is also sold very cheap at Bembatooka. Majunga, on the n. side of the bay, is an important town, Bembatooka being but a village.

BEMBE'CIDÆ, a family of hymenopterous insects of the division in which the females are furnished with stings. Along with *sphegidæ* (q.v.), and other nearly allied families, they receive the popular name of sand-wasps. They very much resemble bees or wasps in general appearance. They are natives of the warmer parts of the world. Some of them are remarkable for the odor of roses which thy emit. The females make burrows in sandy banks, in each of which they deposit an egg, and along with it the bodies of a few flies as food for the larva. The B. fly very rapidly, and with a loud buzzing noise. *Bembex rostrata* is common in the s. of Europe.

BEMBO, PIETRO, one of the most celebrated Italian scholars of the 16th c., was b. in Venice, May 20, 1470; having studied at Padua and Ferrara, he early devoted himself to polite literature. He edited the Italian poems of Petrarch, printed by Aldus, in 1501, and the *Terzerime* of Dante, 1502. In 1506, he proceeded to the court of Urbino, where he resided until 1512, when he went to Rome, where he was made secretary to pope Leo X. On the death of that pope, B. returned to Padua, where he became a liberal patron of literature and the arts, as well as a fertile writer himself. In 1529, he accepted the office of historiographer to the republic of Venice, and was also appointed keeper of St. Mark's library. In 1539, B., who had only taken the minor ecclesiastical orders, was unexpectedly presented with a cardinal's hat by pope Paul III., who afterwards appointed him to the dioceses of Gubbio and Bergamo. He died Jan. 18, 1547. B. united in his character all that is amiable. He was the restorer of good style in both Latin and Italian literature. His taste is said to have been so fastidious with regard to style, that he subjected each of his own writings to forty revisions previous to publication. Some of his writings are marred by the licentiousness of the time. Among his works may be mentioned the *Rerum Venetiearum Libri XII.* (Venice, 1551), of which he published an Italian edition (Venice, 1552); his *Prose*, dialogues in which are given the rules of the Tuscan dialect; *Gli Asolani*, a series of disputations on love, etc.; *Rime*, a collection of sonnets and canzonets; his letters, Italian and Latin; and the work, *De Virgilii Culice et Terentii Fabulis.* His collected works were published at Venice, in 4 vols., 1729.

BEM'BRIDGE BEDS are a division of the upper Eocene strata, resting on the St. Helen's, and capped by the Hempstead series. They are principally developed in the

Isle of Wight. Ed. Forbes, who carefully examined them there, has arranged them in four subdivisions: 1. The upper marls and laminated gray clays, which form the basement bed of the "black band," the lowest member of the Hempstead series. They are distinguished by the abundance of *mélania turretissima*. 2. Unfossiliferous mottled clays, alternating with fossiliferous marls and clays, whose characteristic organisms are *cerithium mutabile* and *Cyrena pulchra*. 3. The oyster-bed, consisting of greenish marl, and containing immense quantities of a species of oyster (*ostrea vectensis*), accompanied with *cerithia*, *mytili*, and other marine mollusca. 4. The Bembridge limestone, generally a compact, pale-yellow, or cream-colored limestone, but sometimes vesicular and concretionary, and containing occasionally siliceous or cherty bands. This is interstratified with shales and friable marls. All the beds are fossiliferous, containing numerous land and fresh-water shells. One bed is composed almost entirely of the remains of a little globular *paludina*. Shells of *Lymnea* and *Planorbis* are abundant, and are accompanied with the spirally striated nucules of two species of *Chara*, water-plants which have been well preserved because of the large quantity of lime which enters into their composition. In this division have been found the mammalian remains of the species of *palæotherium* (q.v.) and *anoplotherium* (q.v.) which characterize the gypseous deposits of Montmartre; it is consequently considered the British equivalent of these Parisian beds.

No marked line of distinction separates this series from the St. Helen's beds on which it rests. The contained organisms indicate that both had the same fluvio-marine origin. The maximum thickness of the Bembridge series is 115 feet.

BEN, ABEN, AVEN, EBN, IBN, are all forms, in the different Semitic languages, of the same word, which means "son," and is used as a prefix to names. *Ben*, a Hebrew form, is familiar to us from its use in Bible names—e.g., Benhadad, the son or worshiper of Hadad, or Adod, the chief idol of the Syrians; Benoni, son of my pain; Benjamin, son of the right hand, etc. These examples show that not only literal but metaphorical sonship is expressed by this prefix. This form of constructing a name by composition was common in the Semitic languages, on account of their lack of patronymics. The plural, *Beni*, is found in the names of many Arab tribes—as Beni Omayyah, the sons of Omayyah, the family known in history as the Ommiades; and sometimes in the names of places—as Beni-Hassan.

BEN, BEIN, or BHEIN, a Gaelic word signifying "mountain" or "mountain head." It is prefixed to the name of a great many mountains in Scotland—as Ben Nevis, Ben Macdhui, Ben Cruachan, etc. The corresponding term in various parts of Europe is *Pen*, which is found in many of the names in Cornwall and Wales, in the Pennine alps, and probably also in the word Apennines and the Cevennes of France.

BEN, OIL OF, a fluid fixed oil, obtained from the seeds of a tree found in India and Arabia, and known as the HORSERADISH TREE (*moringa pterygosperma*). The seeds are called BEN NUTS, and are roundish, with three membranous wings. The oil is used by watchmakers, because it does not readily freeze; also by perfumers, as the basis of various scents; and other oils are often adulterated with it. See HORSERADISH TREE.

BENALCA'ZAR, or BELARCA'ZAR, SEBASTIAN, d. 1550; a Spanish sailor who became conqueror and governor of the province of Popayan, in Peru, in 1538.

BENA'RES, a city on the left side of the Ganges, which here varies, according to the season, between 50 to 92 ft. in depth, and in width between 600 yards and a little more than half a mile. It is in lat. 25° 17′ n., and long. 83° 4′ e., being 421 m. to the n.w. of Calcutta, and 466 and 74 respectively to the s.e. of Delhi and Allahabad. Without reckoning Secrole, which, at the distance of 2 or 3 m. to the westward, contains the official establishments, B. covers, as it were, an amphitheater of 3 m. in front, and 1 m. in depth, the immediate margin of the river, which is comparatively steep, being chiefly occupied by flights of steps, or ghats, as they are called, where crowds of all classes spend the day in business, amusement, or devotion. This lively scene, backed by the minarets of about 300 mosques, and the pinnacles of about 1000 pagodas, presents a truly picturesque appearance to spectators on the opposite shore of the Ganges. On closer inspection, however, the city, as a whole, disappoints a visitor. The streets, or rather alleys, altogether impracticable for wheeled-carriages, barely afford a passage to individual horsemen or single beasts of burden; and these thoroughfares, besides being shut out from sun and air by buildings of several stories, are said to be shared with the numerous passengers by sacred bulls that roam about at will. The pop. in 1872 was 175,188.

In the traditions of the country, B. is believed to have been coeval with creation; and tolerably authentic history does assign to it a really high antiquity. In its actual condition, however, B. is a modern city. Both in extent and in embellishment, it owes much to the influence of Mahratta ascendency, which dates from the close of the 17th c.; and it possesses, perhaps, not a single structure that reaches back to the close of the 16th. As the central seat of Hinduism, B., on high occasions, attracts immense crowds of pilgrims—sometimes as many as 100,000; and some years ago, during an eclipse of the moon, forty persons were trampled to death in the streets. Naturally enough, the Brahmins of B. have always been remarkable for bigotry. Now, however, Brahminism

appears to be on the decline; and a result, which Mohammedan persecution vainly tried to produce, would seem to be gradually achieved, chiefly through the introduction of European literature and science. On the Sanscrit college, instituted in 1792, there was at a later date ingrafted an English department, comprising poetry, history, mathematics, and political economy. It is attended by numerous Hindus, and a few Mussulmans and native Christians. B., as Heber has observed, is very industrious and wealthy, as well as very holy. Besides having extensive manufactures of its own in cotton, wool, and silk, its commanding position on the grand line of communication—road, river, and rail alike—renders it the principal emporium of the neighboring regions. It is the great mart for the shawls of the north, the diamonds of the south, and the muslins of the east; while it circulates the varied productions of Europe and America over Bundelcund, Goruckpore, Nepal, etc. For the general history of the city, see the following article on the district of the same name. The details of the mutiny of 1857 will be found under the head of SECROLE. At the same time, B. proper added its share to the fearful interest of the emergency through the proverbially fanatical character of its inhabitants, who, during the second siege of Bhurtpore, had got 30,000 sabers sharpened in anticipation of a second repulse of the British.

BENA'RES, or BANA'RAS, the district mentioned in the preceding article. It is under the lieutenant-governorship of the n.w. provinces, being bounded on the w. and n. by Jounpur; on the e. by Ghazeepore and Shahabad; and on the s. and w. by Mirzapore. It extends in n. lat. between 25° 7′ and 25° 32′, and in e. long. between 82° 45′ and 83° 38′; and thus measuring about 30 m. by about 55, it embraces an area of 995 sq. miles. In 1872, the census gave a pop. of 794,039, or almost 800 to a sq.m.: the number of inhabited houses was 116,507. The district is traversed by the Ganges in a n.e. direction for about 45 miles. Besides other rivers, such as the Karamnasa, the Goomtee, and the Burna, and several inferior streams, lakes and tanks are numerous, but small, the largest not exceeding a mile in circuit. The annual rain-fall, though averaging less than in the lower parts of the Ganges, is still considerable, always exceeding 30 in., and amounting in 1823 to 89. Considering that the tract is barely beyond the tropics, and but little elevated above the sea, the range of the thermometer is unusually great, being between 45° in Jan. and 111° in May. The mean temperature is stated at 77°, pretty nearly the middle point between the two extremes. The soil, though here and there sterile, is in general characterized by great fertility, more particularly to the left of the Ganges. In the growth of opium, indigo, and sugar—more especially of the last—the district surpasses nearly every other portion of British India. In fact, the state of agriculture is such as may be expected from the density of the population. The rich fields, the thriving villages, and the luxuriant groves render the aspect of the country very delightful; and perhaps the best proof of the presence of industry and civilization is the fact that elephants, rhinoceroses, buffaloes, lions, and tigers, which were hunted in 1529, have entirely disappeared. After a Hindu domination, according to popular faith, of 2400 years, the district sank under the Mussulman yoke in 1193; and, in the first half of the 16th c., it was annexed by Baber to the Mogul empire. On the dismemberment of that dominion, it fell to the share of the Nawab of Oude, whose grandson, in 1775, ceded it to the East India company, about ten years after that body had acquired the sovereignty of Bengal.

BENA'TEK, a small t. of Bohemia, on the right bank of the Iser, a few miles distant from Prague. It is worthy of note as being for a long time the residence of the celebrated astronomer Tycho Brahé.

BENAVEN'TÉ, a t. of Spain, in the province of Zamora. It is situated on the western or right bank of the Esla, opposite to the mouth of the Cea, 34 m. n. from Zamora. It is overlooked by a huge, half-ruined castle, and surrounded by a decayed mud-wall, in which are 6 gates. It has spacious streets and squares, 6 churches, a number of schools, 3 hospitals, a bishop's palace, etc. The castle was formerly the seat of the family of Pimentel, counts of Benavente, to whose progenitor it was granted in 1394. The interior of the castle was desolated by Soult, on his retreat from Oporto, and fragments of sculpture still lie scattered about. It was at B. that Moore's retreat commenced, 28th Dec., 1809; and it was the scene of other interesting events of the peninsular war. B. is now a dull and poverty-stricken place, built chiefly of mud cottages. Pop. 2500. There is no bridge at Benavente. The Esla is crossed by a ferry-boat.

BENBECU'LA, one of the Hebrides or western isles of Scotland, between n. and s. Uist, 20 m. w. of Skye, and belonging to Inverness-shire. It is 8 m. long, and 8 broad, low and flat, and consists chiefly of bog, sand, and lake, resting on a substratum of gneiss rock, with a very broken coast-line. Pop. '71, 1563, consisting of fishermen and small farmers, who fertilize the soil with the sea-weed which is cast ashore on the island.

BENBOW, JOHN, a brave English admiral, was b. in Shropshire in 1650. He first distinguished himself as captain of a merchantman, in a bloody action with Sallee pirates. He attracted the notice of James II., who gave him a commission in the navy. After the revolution, he obtained the command of a large ship, and in the course of a few years was made rear-admiral. The high confidence reposed in him by king Wil-

liam is borne in memory by a very bad pun on his name, said to have been perpetrated by the taciturn monarch. Objecting to several names proposed for the command of an expedition, he said: "No; these are all fresh-water *beaus*, we need another kind of *beau*; we must send *Benbow*." The most memorable of this gallant sailor's exploits was his last, where his stubborn valor contrasted nobly with the dastardly behavior of his captains. Off St. Martha, in the West Indies, on the 19th Aug., 1702, he came up with a superior French force under admiral Du Casse. For four days he kept up a running-fight with the enemy, almost deserted by the rest of his squadron. On the morning of the 24th, his right leg was smashed by a chain-shot. His officers condoled with him. "I had rather have lost them both," said the sturdy admiral, "than have seen this dishonor brought upon the English nation. But, hark ye—if another shot should take me off, behave like men, and fight it out!" As soon as his wound was dressed, he was carried to the quarter-deck, and directed the fight while it lasted. The enemy sustained severe loss; but the infamous cowardice of the other captains, who actually refused to obey the admiral's signals, made the contest hopeless, and B. sailed away to Jamaica. He died of his wound on the 4th November. The recusant officers were tried by court-marshal, and two captains were shot. B.'s employment of explosive vessels at St. Malo seems to have been an anticipation of lord Dundonald's method at Basque roads.

BENCH, a hall or court where justice is administered. In this sense, however, it has in modern times received a more limited acceptation, signifying the dais or elevated part of a court-room or chamber where the judges sit to administer the laws. In English courts of justice, this seat is in form literally a bench or couch running along one end of the court-room, the number of judges and their places on this bench being marked by separate desks, one for each judge; but in Scotland and Ireland the arrangement is different, the judges in these countries sitting on chairs placed at a long, and, as in Scotland, a semicircular table, which is in a raised position. The term B. is also applied, by way of distinction, to the judges themselves as a class; thus, we speak of the *B. and bar.* It has likewise, popularly and conventionally, an ecclesiastical application, the bishops of the church of England being, as a body, sometimes designated by it; hence the expression, "B. of bishops." See BANC.

BENCH, COMMON, COURT OF. This is a technical name sometimes given to the court of common pleas. See COURTS OF COMMON LAW.

BENCH, KING'S or QUEEN'S, the supreme court of common law in the kingdom. See COURTS OF COMMON LAW.

BENCH, UPPER, the name given to the court of king's bench in the time of Cromwell. See preceding notice, and COURTS OF COMMON LAW.

BENCH'ERS. The governing bodies of the four great law societies in England, or inns of court—Lincoln's inn, inner temple, middle temple, and Gray's inn—are so called. They are generally queen's counsel or barristers of distinction; and they annually elect a president or *treasurer*, as he is called, who takes the chair at their corporate meetings, and speaks and acts in their name. See INNS OF COURT.

BENCH-WARRANT is a warrant signed by a superior judge or two justices of the peace, during the assizes or sessions, to apprehend a defendant, against whom a bill of indictment has been found. See WARRANT.

BENCOO'LEN, capital of a Dutch residency on the w. coast of Sumatra, lies in 102° 20′ e. long., and 3° 48′ s. latitude. Pop. 7000. The residency B. has an area of 9567 sq. miles. Rice, coffee, maize, sugar-cane, the cocoa-nut, and other fruits are grown. About 400,000 lbs. of pepper are produced annually. B. was founded by the English (1686), but was given to the Dutch by the London treaty, 11th Mar., 1824. Pop. of district (1871) 128,503.

BEND, one of the honorable ordinaries, or more important figures in heraldry. It is formed by two parallel lines, which may be either straight or indented, engrailled, etc. (q.v.), drawn from the dexter to the sinister base, and consequently passing athwart the shield. The B. occupies a fifth part of the shield in breadth, if plain; and a third part, if charged. The B. is supposed to represent a shoulder-belt, or scarf worn over the shoulder. When heralds speak of the B. simply, the B. dexter is understood, the B. sinister being always expressly mentioned.

Bend Sinister is the bend dexter reversed, and passing from the left to the right side of the shield, as the dexter does from the right to the left. See BAR and BASTARD BAR.

There are four diminutives of the bend—viz., the *bendlet*, the *garter*, the *cost*, and the *ribbon*.

The terms *in bend*, *per bend*, *bendy*, etc., are of frequent occurrence in heraldic works, and signify that the charge is laced, or the shield divided, diagonally in the direction of the bend.

BEND is the name for one among many kinds of knot by which ropes are fastened on shipboard. Seamen imply this meaning when they speak of "bending the cable," "bending a sail," the "carrick B.," the "fishermen's B.," the "sheet B.," etc.

BENDEMANN, EDUARD, one of the most distinguished painters of the Düsseldorf school, was b. in Berlin in 1811. Although he had received a very careful scientific education, he devoted himself to art, became a pupil of Schadow's and soon proved that he had not mistaken his vocation. As early as 1832, his great picture of the "Captive Jews" was exhibited at Berlin, and at once acknowledged to be a master-piece. His next important work, in 1833, represented "Two Girls at a Fountain." It was followed, in 1837, by "Jeremiah at the Ruins of Jerusalem," a very large picture, which excited universal enthusiasm in Paris, where it was exhibited, and for which he obtained a prize-medal. In 1838, B. was summoned to Dresden as member of the academical council, and professor of the academy of art; and the execution of the larger frescoes in the palace was intrusted to his skill. An affection of the eyes, from which he suffered for several years, interrupted the work, which is now, however, completed, and embraces a wide range of historical and mythological subjects. B.'s artistic bias is characteristic of the Düsseldorf school, his pictures being rather lyrical than dramatic. But he is distinguished by a peculiar grace and charm of his own, arising from a most perfect symmetry in drawing and composition, an exquisite *naïveté* in conception, and a tender, harmonious, yet truthful coloring. His portrait of his wife, a daughter of Schadow, is one of his best works. From 1859 till 1867, he was director of the Düsseldorf academy.

BENDER, a fortified t., with a citadel, in the province of Bessarabia, Russia. The town is situated on the right bank of the Dniester, 48 m. from its mouth, and has paper-mills, tanneries, forges, and saltpeter-works. Pop. '67, 24,443, including many Armenians, Tartars, Moldavians, and Jews. In 1770, the Russians captured the place, and put the garrison and inhabitants, then amounting to about 30,000, to the sword. It was restored to the Turks in 1774, and again stormed by the Russians in 1809. The peace of Jassy gave it back to the Turks, from whom it was again taken by the Russians in 1811, who were confirmed in the possession of it by the treaty of Bucharest in the following year.—Charles XII. of Sweden lived for some time, 1709–12, at Varnitza, a village near Bender.

BEN'DIGO, one of the most productive gold-fields in the colony of Victoria, having, in 1857, yielded, according to the official returns, 525,018 ounces. It is about 25 m. to the n. of Mount Alexander, which, again, is about 75 m. inland from Melbourne.

BENDISH, BRIDGET, 1650–1727; grand-daughter of Oliver Cromwell, endowed with much of his mental and physical energy. She had great reverence for the protector, and once challenged to a duel with swords a fellow passenger in a stage coach who had spoken disparagingly of him. Her father was gen. Ireton.

BE'NE, a t. of about 6000 inhabitants, in the province of Mondovi, Piedmont, 18 m. n.e. of Coni. It occupies the site of the ancient *Augusta Bagiennorum*, destroyed by Alaric. Many interesting vestiges are found in the neighborhood; and the ruins of an aqueduct, baths, and amphitheater are still visible.

BENEDEK, LUDWIG VON, an Austrian gen., b. in 1804 at Odenburg, in Hungary, where his father was a physician of repute. He received his military education at the Neustädt academy, and at its close entered the army as ensign in 1822. In 1843, he was promoted to the rank of senior lieut., and on the occasion of the insurrection in Galicia in 1846, had several opportunities of distinguishing himself. In Aug., 1847, as commandant of count Gyulai's infantry regiment, he moved to Italy, where a still more brilliant career awaited him. On the occasion of the retreat from Milan, and especially after Curtalone, where he had led on the assault with great skill and gallantry, his name was mentioned in the army reports by marshal Radetsky in the highest terms; and, consequently, he received the cross of the order of Maria Theresa. He afterwards distinguished himself at the taking of Mortara, and in the battle of Novara. In April, 1849, he was made maj gen. and brigadier of the first body of reserve of the army of the Danube. He commanded the *avant-garde* at Raab and Oszony, and received a slight wound in the affair at Uj-Szegedin; which did not, however, prevent him from taking a most active part in the subsequent engagements of Szörny and Ozs Ivany, where he was wounded in the foot. At the close of the Hungarian campaign, he was ordered again, high in command, to Italy. In the Italian campaign of 1859, B. commanded the 8th corps of the Austrians. At Solferino, B. drove back the Piedmontese with great slaughter, and was the last to leave the field. He was governor of Hungary in 1860, and soon afterwards got the command of the Austrian army in that country. He commanded the Austrians in the war with Prussia in 1866, but shortly after the defeat at Sadowa he was superseded.

BENEDETTI, VINCENT, Count, of Greek origin, b. Corsica, 1815. He has been French consul at Cairo and Palermo; secretary of legation in Constantinople; held office in the French department of foreign affairs, and was secretary during the negotiation of the treaty of Paris in 1856. In 1860, he went to Turin to negotiate the cession of Nice and Savoy; in 1864, he was ambassador to Berlin. B. was personally concerned in the affair of the protest of Napoleon III. against the candidacy of the prince of Hohenzollern for the throne of Spain, and forced himself upon king William in the public walk at Ems, July 13, 1870, in so offensive a manner that he was officially ignored thereafter.

Four days afterwards France declared war. B. also accused Bismarck of originating a Franco-Prussian treaty in 1866 for neutral cessions of territory, but Bismarck showed that B. himself originated the scheme.

BENEDICITÉ, a hymn or song of the three children in the fiery furnace, sung in the Christian church as early as the time of St. Chrysostom, and used in the Anglican church in the morning-services when the Te Deum is not sung.

BENEDICK, or BENEDICT, the lover in Shakespeare's *Much Ado about Nothing*, who marries "Beatrice." The name usually written "benedict" is a synonym for a man recently married, the antithesis of "bachelor."

BENEDICT is the name of fourteen popes. Of these only the following are historically important enough to deserve special mention.—BENEDICT VIII., son of count Gregory of Tuscoli, was elected in 1012; but was driven from Rome by the anti-pope Gregory. In 1014, he was restored to the papal chair by the emperor Henry II., and afterwards defeated the Saracens, and took from them, with the help of the Pisans and Genoese, the island of Sardinia; and also various places in Apulia from the Greeks, by the help of Henry. He distinguished himself as a reformer of the clergy, and interdicted, at the synod of Pavia, both clerical marriage and concubinage. He died in 1024. —BENEDICT IX., a nephew of the preceding, was elected pope at the age of 18, in 1033; but in 1038, the Romans rose in indignation, and banished him on account of his almost unexampled licentiousness. He was reinstalled by Conrad II.; again formally deposed by the consul Ptolemæus, who set up Sylvester III. in his place; and after three months, was once more installed as pope by means of bribery. By a new simoniacal compact, John Gratianus was declared pope under the name of Gregory VI. The emperor Henry III., to remove such gross scandals from the church, deposed all the three popes—B., Sylvester, and Gregory, and caused Suidger, bishop of Bamberg, to be elected as Clement II.; but on his death, in 1047, the deposed B. IX. again corruptly regained the papal see, and held it eight months, until 1049, when he was displaced, first by Damasus II., and afterwards by Leo IX. He died in the convent of Grotta Ferrata in 1056.— BENEDICT XIII., 1724–30, was a learned and well-disposed man, of simple habits and pure morals, though rather strict in his notions of the papal prerogative. He unfortunately yielded himself to the guidance of cardinal Coscia, a greedy, unscrupulous personage, who greatly abused the confidence reposed in him. B. always exhibited great moderation in politics, and an honorable love of peace, and was instrumental in bringing about the Seville treaty of 1729. During this pontificate, a remarkably large number of saints, chiefly from the monastic orders, were added to the calendar.—BENEDICT XIV. (PROSPERO LAMBERTINI), the most worthy to be remembered of all the pontiffs so named, was born at Bologna in 1675. Before his elevation, he had distinguished himself by extensive learning, and by ability in the several offices of *promotor fidei*, bishop of Ancona (1727), cardinal (1728), and archbishop of Bologna (1732). Succeeding Clement XII., he began his pontificate, in 1740, with several wise and conciliatory measures; founded chairs of physic, chemistry, and mathematics in Rome; revived the academy of Bologna, and instituted others; dug out the obelisk in the Campus Martius, constructed fountains, rebuilt churches; caused the best English and French books to be translated into Italian; and in many other ways encouraged literature and science. His piety was sincere, enlightened, and tolerant, and his doctrines were well exemplified in his practice. He was extremely anxious that the morals of the clergy should be untainted; and, to that effect, established a board of examiners for all candidates to vacant sees. In proof of his toleration, he showed the frankest kindness to all strangers visiting his capital, whatever the nature of their religious opinions. The only accusation brought against him by his Roman subjects was, "that he wrote and studied too much, but ruled too little," or left affairs of business too much in the hands of the cardinal Valentine. After a painful illness, B. XIV. died May 3, 1758.—His most important works are that *On the Diocesan Synod; On the Sacrifice of the Mass;* and *On the Beatification and Canonization of Saints.* A complete edition of his writings was published under the care of the Jesuit de Azevedo (12 vols., 1747–51), and in 16 vols. (1777).

BENEDICT, SAINT, the founder of monachism in the west, was born of a rich and respected family at Nursia, in Umbria, Italy, 480 A.D. At an early age B. was sent to the schools of literature and jurisprudence at Rome, but soon grew dissatisfied with the sterile character of the instruction dispensed. The world was full of distractions, impurities, and ignorance; and it was difficult to resist, by the ordinary safeguards of virtue, the colossal evils by which men were environed: only, therefore, in the devotions of religion, in the holy silence of solitary meditation, did B. see a safe refuge from the sins of the time, and the possibility of realizing a spiritual strength which would enable him to stem the tide of corruption that was setting in. He resolved to leave the city, and betake himself to some deep solitude in which the murmur of the world would be inaudible, and alone in the rocky wilderness wrestle with his own nature, until he had conquered it and laid it a sacrifice on the altar of God. In pursuance of this resolution, when he had only reached, according to some, the age of 14, he departed from Rome, accompanied for the first 24 m. by the nurse whom his parents had sent with him as an attendant to the city. B. then left her, and retired to a deserted country lying on a lake, hence called *Sublacum* (now Subiaco). Here, in a cavern (which afterwards

received the name of the Holy Grotto), he dwelt for three years, until his fame spread over the country, and multitudes came to see him. He was now appointed abbot of a neighboring monastery; but soon left it, as the morals of the half-wild monks were not severe enough for his taste. This, however, only excited a livelier interest in his character, and as he lived in a period when the migration and interfusion of races and nations were being rapidly carried on, he could not fail to draw crowds of wanderers about him. Wealthy Romans also placed their sons under his care, anxious that they should be trained for a spiritual life. B. was thus enabled to found 12 cloisters, over each of which he placed a superior. The savage *Goths* even were attracted to him, and employed in the useful and civilizing practice of agriculture, gardening, etc. He now sought another retreat, and, along with a few followers, founded a monastery on Monte Cassino, near Naples, afterwards one of the richest and most famous in Italy. Here he extirpated the lingering relics of paganism, and had his celebrated interview with Totila, king of the Goths, to whom he spoke frankly and sharply on his errors. In 515, he is said to have composed his *Regula Monachorum*, in which he aimed, among other things, at repressing the irregular and licentious life of the wandering monks, by introducing stricter discipline and order. It eventually became the common rule of all western monachism. The monasteries which B. founded were simply religious colleges, intended to develop a high spiritual character, which might beneficially influence the world. To the abbot was given supreme power, and he was told to acquit himself in all his relations with the wisdom of God, and of his Master. The discipline recommended by St. B. is, nevertheless, milder than that of oriental monachism with regard to food, clothing, etc.; but enjoins continual residence in the monastery, and, in addition to the usual religious exercises, directs that the monks shall employ themselves in manual labors, imparting instruction to youth, copying manuscripts for the library, etc. By this last injunction, St. B., though this was not directly intended, preserved many of the literary remains of antiquity; for the injunction, which he gave only with regard to religious books, was extended afterwards to many secular productions. It is remarkable that the founder of the most learned of all the monastic orders was himself so little of a scholar, that St. Gregory the great described him as being "*scienter nesciens, et sapienter indoctus*"—learnedly ignorant, and wisely unlearned. St. B. died Mar. 21, 543.

BENEDICT, Sir JULIUS, a musician and composer, German by birth, but, since 1836, resident in England. He was born at Stuttgart in 1805, and studied first under Hummel at Weimar, and afterwards under Weber at Dresden. On Weber's recommendation, he was, in 1824, made music director of the Kärnther Thor theater, Vienna; and he afterwards filled the same post in Naples. While in Naples, he produced an opera buffa called *Gracinta et Ernesto*, and an opera seria, *I Portogesi a Goa*. In Paris, and afterwards (1835) in London, he appeared with great success as a pianist. In 1836, he took up his permanent residence in London; and was, during that year, director of the opera buffa at the Lyceum, where he produced an operetta of his own, composed in Naples, *Un Anno ed un Giorno*. Turning his attention afterwards to English opera, he composed *The Gipsy's Warning* (1838), *The Brides of Venice* (1844), and *The Crusaders* (1843), three works which, translated into German, have been well received in the composer's native country. He conducted the opera in Covent Garden theater in 1843 and 1844, and the Norwich musical festival in 1845, and has since conducted much at concerts and great musical gatherings in London and in the provinces, besides being a successful pianoforte teacher. In 1850, he conducted at mademoiselle Jenny Lind's concerts in America. In 1860, he produced a cantata, *Undine*, at the Norwich musical festival, which was very well received. His *Lily of Killarney*, first given in 1862, at Covent Garden, was his greatest operatic success. He has since produced a cantata, *Richard Cœur de Lion*; an opera di camera, *The Bride of Song;* a romantic opera, *Esmeralda;* and a cantata, *St. Cecilia*. His operas have much dramatic and melodic beauty, and in style and feeling are singularly English, to be the composition of a foreigner. His oratorio, *St. Peter*, written for the Birmingham musical festival, 1870, met with extraordinary success. His first symphony was received with great favor in 1873. In 1878, he was for the 13th time conductor of the Norwich festival. Knighthood was conferred on B. in 1871, and he holds many foreign orders.

BENEDICT BISCOP, an English ecclesiastic of the 7th c., who exercised a most important influence on Anglo-Saxon civilization and learning. He was born about the year 629, of a noble Northumbrian family (his patronymic, according to Eddius, being Baducing), and until about his 25th year, was a courtier of Oswin, king of Northumberland. About that time, he gave up his court-life, and accompanied Wilfred to Rome (654), where he spent about ten years in study, and from which he seems to have returned soon after the synod of Whitby in 664. In 665, he was in Rome a second time, being sent on a mission by Alchfrid, king of Northumbria. After a stay at Rome of a few months, he proceeded to Lerins, in Provence, where he became a monk, received the tonsure, and spent about two years, thus acquiring a knowledge of monastic discipline. He returned to Rome in 668, came to England with Theodore and Adrian, and was made abbot of the monastery of St. Peter (afterwards that of St. Augustine) in Canterbury. This he resigned two years after, and went to Rome for a third time, for the purpose of bringing home the literary treasures which he had already collected. He returned

about 673, bringing with him a large collection of valuable books, and repaired to Northumbria, where king Ecgfrid gave him land near the mouth of the Wear, on which he founded the famous monastery of Wearmouth. Workmen were brought from France to build and glaze the church and monastery, this being one of the earliest instances of the use of glass for windows in England. He also introduced from Gaul and Rome (which he visited again in 678) church utensils and vestments, relics, pictures, images, and again a vast number of books. He also brought with him John, arch-chanter of St. Peter's, who introduced the Roman choral service. On his return from this visit to Rome, king Ecgfrid presented him with more land on the other side of the Wear, at a place called Girwi, on which he built a second monastery, dependent on Wearmouth. B. made his fifth and last journey to Rome in 685, and, as on former occasions, came home loaded with books and pictures, bringing with him also, according to Bede, two silk palls "of incomparable workmanship." Shortly after his return from Rome, about 687, he was seized with palsy, under which he languished three years, dying on the 12th Jan., 690. During his long illness, he often anxiously exhorted his monks to look carefully after his books, and preserve them from loss or injury.

The benefits conferred by B. on Anglo-Saxon civilization, which was then only in its dawn, and the impulse given by his labors to Anglo-Saxon learning, were greater than can now be estimated. It is not certain that he wrote any books, and those ascribed to him are of little value; but by his personal teaching, and especially by his founding at Wearmouth such a valuable and, for the time, extensive library, he implanted in the nation a taste for literature and learning, which soon was fruitful in results, and continued to be so for many centuries. Bede, who was his pupil, has written a life of B., and the numerous works of this "venerable" author are the best proof of the extent and variety of information to which he had access in the monastery of Wearmouth.—See Wright's *Biographia Britannica Literaria*.

BENEDICTINE EDITIONS OF THE FATHERS, scarce and costly volumes containing the works of Barnabas, Lanfranc, Bernard, Anselm, Augustine, Cassiodorus, Ambrose, Hilary, Jerome, Athanasius, Gregory of Tours, Gregory the great, Hildebert, Irenæus, Lucius Cæcilius, Chrysostom, Cyril of Jerusalem, Basil, Cyprian, Justin Martyr, Origen, and Gregory Nazianzen; in all 61 volumes.

BENEDICTINES, the general name of all the monks following the rule of St. Benedict. The first Benedictine monastery was that founded at Monte Cassino, in the kingdom of Naples, about 529, by St. Benedict himself. The order increased so rapidly, after the 6th c., that the B. must be regarded as the main agents in the spread of Christianity, civilization, and learning in the west. They are said at one time to have had as many as 37,000 monasteries, and counted among their branches the great order of Clugny, founded about 910; the still greater order of the Cistercians, founded in the following century; the congregations of Monte Cassino in 1408, of St. Vanne in 1600, and of St. Maur on the Loire, in 1627. To this last congregation all the Benedictine houses in France were affiliated. It had afterwards its chief seat at St. Maur, near Vincennes, and more lately at St. Germain-des-Prés, near Paris. Its fine conventual buildings at St. Maur on the Loire were destroyed during the revolutionary troubles. Numbering among its monks such scholars as Mabillon, Montfaucon, Sainte-Marthe, D'Achery, Martene, Durand, Rivet, Clemencet, Carpentier, Toustain, Constant, and Tassin, it has rendered services to literature which it would be difficult to overestimate. Besides admirable editions of many of the fathers, the world of letters owes to the B. of St. Maur the *Arte de Vérifier les Dates* (1783–87, in 3 vols. fol.); a much enlarged edition of Ducange's *Glossarium Mediæ et Infimæ Latinitatis* (1733–36, in 6 vols. fol.), with a supplement (1766, in 4 vols. fol.); the *De Re Diplomatica* (1681 and 1709, fol.); the *Nouveau Traité Diplomatique* (1750–65, in 6 vols. 4to); *L'Antiquité Expliquée* (1719–24, in 15 vols., fol.); the *Monuments de la Monarchie Française* 1729–33, in 5 vols. fol.); the *Acta Sanctorum S. Benedicti* (1688–1702, in 9 vols. fol.); the *Annales Ordinis S. Benedicti* (1713–39, in 6 vols. fol.); a new and much improved edition of the *Gallia Christiana* (1715–1856, in 14 vols. fol.); the *Veterum Scriptorum Spicilegium* (1653–77, in 13 vols. 4to); the *De Antiquis Monachorum Ritibus* (1690, in 2 vols. 4to); the *De Antiquis Ecclesiæ Ritibus* 1700–2,) in 3 vols. 4to); the *Thesaurus Novus Anecdotorum* (1717, in 5 vols. fol.); the *Veterum Scriptorum et Monumentorum Amplissima Collectio* (1724–33, in 9 vols. fol.); the *Histoire Litteraire de la France* (1733–49, in 9 vols. 4to). The B. were suppressed in France, along with the other monastic orders, at the revolution in 1792; and their splendid conventual buildings at St. Maur on the Loire were destroyed. They have lately been revived; and the B. of Solesmes, established in 1837, have resumed, under the direction of dom Gueranger, dom (now cardinal) Pitra, and others, some of the works which the B. of St. Maur left unfinished, and entered on literary enterprises of their own, such as the *Spicilegium Solesmense*, in 10 vols. 4to, of which four have already appeared. The chief B. houses in Germany were those of Prum, Ratisbon, Fulda, Elwang, and Saltzburg; in Spain, they had Valladolid, Burgos, and Montserrat; in Italy, Monte Cassino, Rome, Padua, and Capua. In England, most of the richest abbeys and all the cathedral priories (excepting Carlisle) belonged to this order. In Scotland the B. had the monasteries of Dunfermline, Coldingham, Kelso, Arbroath, Paisley, Melrose, Newbottle, Dundrennan, and others. In Germany, several Benedictine monks distinguished themselves as promoters of edu-

cation in the 10th c.; while in the latter half of the 11th c., the B. Lanfranc and Anselm, archbishops of Canterbury, laid the foundation of mediæval scholasticism. In Italy, also, the B. gained distinction as literati, jurists, and physicians; but almost everywhere corruption of manners appears to have accompanied increasing wealth, until gradually it became the practice to receive, almost exclusively, the sons of noble and wealthy persons as novices among the "black monks." Several of the popes attempted a reformation of the order, and at the general council of Constance, 1416, a plan of reform was laid down, but failed in being carried into practice. In the 15th c., the B. had 15,107 monasteries, of which only 5000 were left after the reformation, and now not more than about 800 can be counted. As early as 1354, this order could boast of having numbered among its followers 24 popes, 200 cardinals, 7000 archbishops, 15,000 bishops, 1560 canonized saints, and 5000 holy persons judged worthy of canonization, and 37,000 monasteries, besides 20 emperors, 10 empresses, 47 kings, above 50 queens, 20 sons of emperors, 48 sons of kings, 100 princesses, and an immense number of the nobility. Tanner (*Notit. Monast.*) enumerates 113 abbeys and other institutions of B. in England, and 73 houses of Benedictine nuns. From their dress—a long black gown, with a cowl or hood of the same, and a scapulary—the B. were commonly styled "black monks." The institution of convents for nuns of this order cannot be traced back beyond the 7th century.

The rule of St. Benedict was less severe than that which the eastern ascetics followed. Besides implicit obedience to their superior, the B. were to shun laughter, to hold no private property, to live sparely, to exercise hospitality, and, above all, to be industrious. Compared with the ascetic orders, the B., both in dress and manners, may be styled the gentlemanly order of monks: and whatever may be said of their religion, they deserve a high tribute of respect for their artistic diligence and literary undertakings. Speaking of the great productions of the B. above noticed, Sir Walter Scott characterizes them as "works of general and permanent advantage to the world at large; showing that the revenues of the B. were not always spent in self-indulgence, and that the members of that order did not uniformly slumber in sloth and indolence." Among the chief works on the history of the B. are the *Annales Ordinis S. Benedicti*, and the *Acta Sanctorum S. Benedicti*, already referred to; Reyner's *Apostolatus Benedictinorum in Anglia* (Douai, 1626, fol.); the *Bullarium Cassinense* (Venice, 1650, 2 vols. fol.); Tassin's *Histoire de la Congrégation de Saint Maur* (Paris, 1770); *Chronica de la Order de San Benito* (Salamanca, 1609-15, 7 vols. fol.); *Regula S. Benedicti et Constitutiones Congregationis S. Mauri* (Paris, 1770, 8vo); Montalembert's *Moines de l'Occident.*

BENEDICTINES (*ante*), an order of Roman Catholic nuns said to have been founded by St. Scholastica, a sister of St. Benedict. In Germany, where they had part in the conversion of the people, they look upon St. Walpurga as their founder. There are establishments in several of the United States, the earliest, in 1853, being that of St. Mary's in Pennsylvania.

BENEDICTION (from the Lat. *benedicere*, to speak well), signifies a solemn invocation of the Divine blessing upon men or things. The ceremony in its simplest form may be considered almost coeval with the earliest expressions of religious feeling. We know from Holy Writ that the Jewish patriarchs before they died invoked the blessing of God upon their children, and at a later period the priests were commanded to implore the Divine blessing upon the people. Christ sanctioned the custom, which was consequently carried forward into the primitive church, where it gradually developed itself in different forms. In the eastern as well as the western church, it is considered an essential preliminary to almost all important acts. One of the most superb spectacles that a stranger at Rome can witness, occurs on Easter Sunday, when the pope, attended by his cardinals, pronounces after mass a solemn B. *urbi et orbi* (on the city and the world). The B., however, is not confined to a form of prayer, but is accompanied with sprinkling of holy water, use of incense, making the sign of the cross, etc. The chief cases in which a B. is bestowed are—the coronation of kings and queens, the confirmation of all church dignitaries, and the consecration of church vessels, bells, and sacred robes; the nuptial ceremony, the absolution, and the last sacrament. The most solemn form of B. in the Roman church is that "with the most holy sacrament," which is administered by the bishop or priest with the monstrance or ostensory containing the consecrated elements. Besides these, lands, houses, cattle, etc., often receive a B. from the priest. In the English church-service, there are two benedictions; in the Scotch, only one. In the Greek church, when the B. is being pronounced, the priest disposes his fingers in such a manner as to convey symbolically to the faithful who are close enough to observe the arrangement, the doctrine of the Trinity, and the twofold nature of Christ.

BENEDICTUS, a portion of the service of the mass of the Roman church—also the so-called "canticle of Zachary" (Luke i. 68-79), used in the Roman service of matin-lauds, and thence adopted into the anglican morning service.

BENEDIX, JULIUS RODERICH, b. 1811; a German dramatic author, an actor and vocalist, and in 1841 manager of a theater in Wesel, where he produced *The Old Fogy*, a comedy. Since then he has written more than 30 plays, some of which have

been translated into English. He is the author of *Pictures from the Life of Actors*, and works on German legends, etc.

BEN'EFICE, or BENEFI'CIUM (Lat. "a good deed," also "a favor," and hence "a grant," or "a provision" generally, and now more especially, a provision made for an ecclesiastical person), was a term formerly applied to feudal estates, but is now used to denote certain kinds of church preferment, such as rectories, vicarages, and other parochial cures, as distinguished from bishoprics, deaneries, and other ecclesiastical dignities or offices. In this sense a distinction is accordingly taken by the 1 and 2 Vict. c. 106, s. 124, between *benefices* and *cathedral preferments;* by the former being meant all parochial or district churches, and endowed chapels and chapelries; by the latter, all deaneries, archdeaconries, and canonries, and generally all dignities and offices in any cathedral or collegiate church, below the rank of a bishop. See note in 3 Stephen's *Com.*, p. 27. By the 5 and 6 Vict. c. 27, s. 15, which is an act to enable incumbents to devise lands on farming leases, it is enacted that the word B. shall be construed to comprehend all such parochial preferment as we have above described, "the incumbent of which, in right thereof, shall be a *corporation sole*" (q.v.); and by an act passed in the same session, chap. 108, being an act for enabling ecclesiastical corporations to grant long leases, it is, by section 31, declared that B. shall mean every rectory, *with or without cure of souls*, vicarage, etc., the incumbent or holder of which shall be a corporation sole. But by a later act, the 13 and 14 Vict. c. 98, which is an act to extend a former act, the 1 and 2 Vict. c. 106, against pluralities, the term B. is, by section 3, explained to mean B. *with the cure of souls and no other*, anything in any other act to the contrary notwithstanding. Benefices are also *exempt* or *peculiar*, by which is meant that they are not to be under the ordinary control and administration of the bishop; but, by section 108 of the 1 and 2 Vict. c. 106, above mentioned, it is provided that such exempt or peculiar benefices shall nevertheless, and so far as relates to pluralities and residence, be subject to the archbishop or bishop within whose province or diocese they are locally situated.

There are, in general, four requisites to the enjoyment of a benefice. 1st, holy orders, or ordination at the hands of a bishop of the established church or other canonical bishop (a Roman Catholic priest may hold a benefice in the church of England on abjuring the tenets of his church, but he is not ordained again); 2d, Presentation, or the formal gift or grant of the B. by the lay or ecclesiastical patron; 3d, Institution at the hands of the bishop, by which the cure of souls is committed to the clergyman; and 4th, Induction, which is performed by a mandate from the bishop to the archdeacon to give the clergyman possession of the temporalities. Where the bishop is himself also patron, the presentation and institution are one and the same act, and called the *collation* to the benefice. In Scotland, the law on this subject is regulated by the 6 and 7 Vict. c. 61, passed in 1843, and commonly called lord Aberdeen's act. See ESTATE, LIVING, PARISH, PLURALISM.

BENEFICIARY is a legal term sometimes applied to the holder of a benefice. It may also denote a person who is in the enjoyment of any interest or estate held in trust by others, in which latter sense it is strictly and technically used in the law of Scotland, all having right or interest in trust-funds and estate being in that system called beneficiaries. The technical term in the law of England corresponding to this latter meaning of the word is *cestui que trust* (q.v.). Patent rights and copyrights are denominated B. privileges. See TRUST.

BENEFIT SOCIETIES, associations for mutual benefit chiefly among the laboring classes, and of which there are now great numbers; being better known under the name of FRIENDLY SOCIETIES, we refer for an account of them to that head. Meanwhile, we confine attention to that peculiar species of associations called BENEFIT BUILDING SOCIETIES, which are much better described as building societies only. These are societies established for the purpose of raising, by periodical subscriptions, a fund to assist members in obtaining heritable property, freehold or otherwise. They were formerly regulated by an act passed in 1836, the 6 and 7 William IV., and continued under its provisions till Nov., 1874, when a new act, which received the royal assent in July of that year, came into operation. All societies established thereafter *must* be governed by this later act, and those which were in existence at the time of its enactment *may* adopt it, but it is not compulsory upon them to do so. The act of 1836 declares that it shall be lawful to establish such societies, for the purpose of enabling the members to erect and purchase dwelling-houses, or acquire other real or leasehold estate, but which shall be mortgaged to the society until the amount or value of the shares drawn on shall be fully repaid with interest and all other appropriate payments. A share is not to exceed in value £150, and the corresponding monthly subscription is not to be more than twenty shillings. A majority of the members may make rules and regulations for the government and guidance of the society, such rules not being repugnant to the provisions of the act, nor to the general laws of the realm; and for offenses against these rules and regulations, fines, penalties, and forfeitures may be inflicted. No member shall be allowed to receive any interest or dividend on his share until the same has been realized, except on the withdrawal of such member according to the rules of the society.

The new act considerably enlarges the scope and powers of B. S. Section 13

declares that any number of persons may establish a society, either terminating or permanent, for the purpose of raising, by the subscriptions of the members, a stock or fund for making advances to members out of the funds of the society, upon security of freehold, copyhold, or leasehold estate, by way of mortgage; and any society under the act shall, so far as is necessary for the said purpose, have power to hold land, with the right of foreclosure, and may from time to time raise funds by the issue of shares of one or more denominations, either paid up in full or to be paid by periodical or other subscriptions, and with or without accumulating interest, and may repay such funds when no longer required for the purposes of the society. It will be seen that the restrictions of £150 and twenty shillings have disappeared, the contributions and ultimate value of a member's interest being at his own discretion. The liability of members, in respect of shares upon which an advance has been made, is limited to the amount actually paid or in arrear thereon; and in respect of shares upon which advances have been made, is limited to the amount payable under any mortgage or other security, or under the rules. Societies are empowered to receive deposits or loans, from members or other persons, corporate bodies, joint-stock companies, or terminating building societies, provided, in the case of permanent societies, that the total amount owing at one time shall not exceed two-thirds of the amount for the time being secured to a society by mortages from its members; and in the case of terminating societies, shall not exceed two-thirds as aforesaid, or a sum not exceeding twelve months' subscriptions on the shares for the time being in force. Societies established under or adopting the act of 1874 are bodies corporate, having perpetual succession and a common seal, thus dispensing with the cumbrous and inconvenient system of trusteeship. Their rules must specify the society's name and place of meeting; mode of raising funds, with their purposes and mode of investment; terms of withdrawal and repayment; manner of alteration of rules; the appointment, remuneration, and removal of officers; provisions as to general and special meetings, and the settlement of disputes, custody of seal, mortgage deeds, and securities, powers of directors and other officers, fines, and mode of dissolution. Societies may unite with others, or one society may transfer its engagements to another. They may purchase, build, hire, or take on lease any building for conducting their business. Minors may be members, but cannot vote or hold office during nonage. Accounts are to be furnished to members and loan depositors annually. The societies are exempt from stamp duties of every kind, except those upon mortgages; while those which continue under the act of 1836 retain their present exemption from stamp-duty upon mortgages also up to £500. It is not probable that this difference will be permitted to continue long; and even now the slight gain is more than counterbalanced by the privileges of incorporation, etc., conceded by the act of 1874. Receipts indorsed upon mortgages are sufficient discharges without reconveyance.

Two great divisions of building societies exist, the terminating and the permanent, but the latter are rapidly superseding the former. In the best-conducted societies, subscriptions are received at any time and to any amount, at the option of the member. The majority of members pay from ten to twenty shillings per month, and others pay smaller or much larger sums as convenient. Very large sums are received in some societies. Two societies in Bradford, Yorkshire, alone receive £900,000 per annum, and have 20,000 contributing members. Other large towns in the provinces are not far behind, and in London the societies are numerous, and in the main prosperous. The royal commissioners on friendly societies, reporting on this branch of their subject in 1872, say that they are below the mark in assuming that building societies form a group of bodies with a subscribed capital of over £9,000,000, a loan or deposit capital of over £6,000,000, over £17,000,000 total assets, having over £16,000,000 advanced on mortgage, and an income of over £11,000,000.

The theory of these institutions is very simple. Money is collected in comparatively small sums from large numbers of people, and lent to others who borrow upon real security, either to build or trade, or for any other purpose. There was a time when members were only permitted to subscribe fixed sums at stated times, and every departure from rule was visited by heavy fines. Now, in the best-conducted societies at least, every facility is given for varying powers of investment to find a place for capital, little or much; and entrance and withdrawal are equally easy. In most cases, the repayments are upon a scale calculated to pay off both principal and interest in a certain number of years, usually about fourteen, but advances on private mortgage or repayable at the borrower's convenience are becoming more frequent every year. In fact, the almost limitless adaptability of the building society system has only been appreciated of late years, and every decade sees changes and improvements in it. Under the new legislation the societies may look forward to a still more prosperous future.

BENEFIT OF CLERGY. This expression relates to happily a former state of the law of England, which at once shows the power of the clergy and the ignorance of the people. It was otherwise called *privilegium clericale*, and in the days of its real meaning and force, the benefit or privilege meant little short of the total exemption of the clerical order, in respect of crimes and offenses, from the jurisdiction and authority of the secular magistrate—an exemption pretended to be founded upon the text of Scripture, "Touch not mine anointed, and do my prophets no harm." The only exception to this

was the priest being held in custody by the king himself; but even in that case, he could only remain in such regal custody with the pleasure and consent of the bishop, who had entire control over his person, and over the inquiry into his offense. If a priest or "clerk" happened to be imprisoned by the secular arm, on a criminal charge or capital felony, he was, on the bishop's demand, to be instantly delivered up without any further inquisition; not, indeed, to be let loose upon the country, but to be detained by the ordinary, till he had either purged himself from the offense, or, having failed to do so, had been degraded; and this state of things continued till the reign of Henry VI., when it was settled that the prisoner should first be arraigned, and might either then claim his B. of C. by plea declining the jurisdiction, or, as was most usually practiced, after conviction, by way of arresting judgment. The test of admission to this singular privilege was the clerical dress and tonsure; and a story is told of one William de Bussy, a sergeant-at-law, 1259 A.D. (the practicing lawyers then were all priests), who, being called to account for his great knavery and malpractices, claimed the benefit of his orders or clergy, which till then remained an entire secret, and to this end wished to untie his coif, that he might show that he had the clerical tonsure; but this was not permitted, and the bystanders seizing him, not by the coif, but by the throat, dragged him to prison. See 1 Stephen, p. 17. But in course of time a much wider and more comprehensive criterion was established, all who could *read*, whether of the clergy or laity—a mark of great learning in those days—and therefore capable of becoming clerks, being allowed the privilege. But laymen could only claim it *once*, and upon so doing, were burned on the hand, and discharged; to be again tried, however, by the bishop, whose investigation usually resulted in an acquittal, which, although the offender had been previously convicted by his country, or perhaps by his own confession, had the effect of restoring him to his liberty, his credit, and his property—in fact, the episcopal acquittal so entirely whitewashed him, that in the eye of the law he became a new and innocent person. The mode in which the test of reading was applied was as follows: On conviction, the felon demanded his clergy, whereupon a book (commonly a psalter) was put into his hand, which he was required to read, when the judge demanded of the bishop's commissary, who was present, *Legit ut clericus?* and upon the answer to this question depended the convict's fate: if it were simply *legit*, the prisoner was burned on the hand, and discharged; but if *non legit*, he suffered the punishment due to his offense. But by 5 Anne, c. 6, the B. of C. was extended to all persons convicted of clergyable offenses, whether they could read or not; and by the same statute and several subsequent ones, instead of burning on the hand, a discretionary power was given to the judge to inflict a pecuniary fine or imprisonment. But all further attempts to modify and improve the law on this subject proving impracticable, the B. of C. was at last totally abolished, by the 7 and 8 Geo. IV. c. 28; and now by the 4 and 5 Vict. c. 22, the same is the law with regard to the peers.

This privilege had never any existence or legal meaning in Scotland; and a learned writer on the law of that country complains of its introduction into a statute applicable to Scotland (Hutchison's *Justice of the Peace in Scotland*, vol. ii., p. 131). See on the subject of this article generally, Kerr's *Blackstone*, vol. iv., p. 452; Hale's *Pleas of the Crown*, part 2, c. 45; and Reeves's *History of the English Law*.

BENEFIT OF INVENTORY, in the Scotch law, was a legal privilege whereby an heir secured himself against unlimited liability for his ancestor, by giving up, within the *annus deliberandi* (q.v.), an inventory of his heritage or real estate, to the extent of which, and no further, was the heir liable. But the *annus deliberandi* is now abolished, and the privilege in question is of the less consequence, seeing that by the 10 and 11 Vict. c. 47, ss. 23 and 25, decrees of service infer only a limited representation of a deceased party, and the heir is only liable to the extent of the inheritance descending to him. See ANNUS DELIBERANDI, HEIR, INHERITANCE, DEBT, and MORTGAGE.

BENEKE, FRIEDRICH EDUARD, professor of philosophy in Berlin, was b. in that city in 1798, and studied theology and philosophy, first at Halle, and then at Berlin. In 1820, he commenced lecturing in the latter university, but his lectures were soon interdicted by the minister Altenstein, as his philosophical views were quite opposed to those of Hegel. After a few years his lectures were again allowed, and on Hegel's death, in 1835, he was appointed extraordinary professor of philosophy. In Mar., 1854, B. disappeared suddenly from his residence, and nothing more was heard of him until June, 1856, when his body was found in the canal at Charlottenburg in the same place in which he had sought his death. B. has more affinity with British thinkers than any other German philosopher. He holds that the only possible foundation for philosophy lies in a strict adherence to the facts of our consciousness. His system of psychology is therefore what the Germans call "empirical," and his method is the Baconian as pursued in natural science. Of his numerous writings may be mentioned *Psychologische Skizzen* (2 vols. 1825–27); *Lehrbuch der Psychologie als Naturwissenschaft* (Text-book of Psychology as a Natural Science, 2d ed. 1845); *System der Logik* (2 vols. 1842); *Erziehungs-und-Unterrichtslehre* (A Treatise on Education, 1842). The best German educationists recommend B.'s psychology as more capable of practicable application than the prevailing systems of Germany.

BENET, STEPHEN VINCENT, b. Fla., 1827; a graduate of the West Point military academy. He has translated Jomini's *Political and Military History of the Campaigns of Waterloo;* in 1862, he published *Military Law and the Practice of Courts-Martial*, which is received as a text-book at the academy. During the war he did service in several responsible positions in the ordnance department, and was brevetted lieut.col. In 1874, he became chief of ordnance, with the rank of brig.gen.

BENEVENTO (ancient *Beneventum*), a city of southern Italy, capital of the province of the same name. It occupies the site of the ancient city, out of the materials of which it is entirely built, on the declivity of a hill, near the confluence of the Calore and Sabato, about 32 m. n.e. of the city of Naples. B. is about two m. in circumference, is surrounded by walls, has a citadel, a fine old cathedral, some noteworthy churches, and a magnificent arch, erected to the honor of the emperor Trajan, by the senate, 114 A.D., which, with the single exception of that of Ancona, is the best preserved specimen of Roman architecture in Italy. It is an archiepiscopal see, and has a pop. of (1872) 20,133. B. is a place of very great antiquity. Some writers attribute its origin to Diomed, and in the cathedral is a bass-relief representing the Calydonian boar adorned for sacrifice, said to be the gift of the Greek hero himself. Others give the credit of its origin to Auson, a son of Ulysses and Circe. It was, however, in the possession of the Samnites, when history first takes notice of it, and it appears to have been captured from them by the Romans, some time during the third Samnite war. It was certainly in the hands of the Romans, 274 B.C., who changed its name from Maleventum to Beneventum, six years later, and made it a Roman colony. The Carthaginians under Hanno were twice decisively defeated in the immediate neighborhood, during the second Punic war. It rapidly rose to a place of importance under the Roman empire, and was visited at various times by several of the emperors.

Under the Lombards, who conquered it in the 6th c., B. continued to flourish, and became the capital of a duchy which included nearly the half of the late kingdom of Naples. In the 9th c. the duchy was separated into three states—B., Salerno, and Capua. In 1077, the whole was taken possession of by the Normans, excepting the town and its present delegation, which had previously (1053) been presented to the pope, by the emperor Henry III. During the 11th and 12th centuries, four councils were held at the city of Benevento. Since that time, with some slight intervals, it has remained under the direct dominion of the popes, who govern it through a resident cardinal with the title of legate. In 1806, it was made a principality by Napoleon, with Talleyrand as prince of B.; but it was restored to the pope in 1815. In 1848–49, B. was faithful to the pope. The province of B. has an area of 675 sq.m.; pop. '72, 231,878.

BENEVOLENCE, in the history of the law of England, was a species of forced loan, arbitrarily levied by the kings in violation of Magna Charta, and in consequence of which it was made an article in the Petition of Rights, 3 Car. I., that no man shall be compelled to yield any gift, loan, or B. tax, or such like charge, without common consent by act of parliament; and by the statute 1 Will. and Mary, st. 2, c. 2, it is declared, that levying money for or to the use of the crown, by pretense of prerogative, without grant of parliament, or for longer time, or in other manner than the same is or shall be so granted, is illegal. See Hallam's *Constitutional History of England*, and 1 Stephen's *Com.*, p. 167.

BEN'EZET, ANTHONY, 1713–84; b. France; an American philanthropist, and one of the earliest opponents of the slave trade. He resided in Philadelphia, and left his property to endow a school for colored children.

BENFEY, THEODOR, b. 1809; professor of Sanskrit and comparative philology in the university of Göttingen. Some of his works are the *Hymn of Samaveda*, a Sanskrit grammar, a Sanskrit-English dictionary, and the *History of the Science of Languages and Oriental Philology in Germany since the commencement of the Nineteenth Century.*

BENGAL', the name of a presidency, and a province in Hindustan, the latter being distinguished as B. *proper*. In 1765, the soubah or viceroyalty of this name was, along with Bahar and part of Orissa, ceded by the great Mogul, virtually in full sovereignty, to the English East India company. As a natural consequence of this acquisition of territory, the presidency of Calcutta, which had been separated from that of Madras in 1707, came to be styled the presidency of Bengal. Moreover, in 1773, this, the youngest of the three distinct governments of British India, was elevated above both its older rivals by an act of parliament, which declared its immediate ruler to be *ex officio* the governor-general of the whole of the company's dominions. With its commanding position on and around the delta of the Ganges and the Brahmaputra, B., as a presidency, grew almost as uninterruptedly as a tree, alike to the n.w. and to the s.e.—far beyond the basins of its own mighty rivers. Within less than 90 years, it had overleaped, without a break in its continuity, at once the Irrawaddy and the Indus. Benares in the one direction, was the first considerable increment, having been absorbed in 1775; while the last addition of importance—unless one should except Oude, which, however, had really become British in 1801—was Pegu, in the other direction, the Burmese war of 1852 filling up the gap on the coast which that of 1826 had still left between Assam and Aracan on the n., and

Tenasserim on the south. From Tenasserim to the Punjab inclusive, B., as a presidency, embraced about 29° of long., and about 21° of lat. Further, it comprised, to the s.e., the detached settlements of Penang, Malacca, and Singapore; while to the n.w. it might, for a time at least, have claimed Afghanistan. The whole of this vast tract was, either directly or indirectly, under the immediate rule of the governor-general, advised, and in some cases, controlled, by a council of 5 members, of whom one was the commander-in-chief, and at least one other was not to be a company's servant.

Some time ago, the presidency of B., having proved to be too extensive for a consolidated administration, was divided into three portions—one portion remaining under the governor-general, and two being assigned to subordinate functionaries, the lieutenant-governors respectively of "the north-western provinces," and of 'Bengal.'" The first portion, under the direct sway of the governor-general, consisted of the Punjab (q.v.), the Cis-Sutlej states, 4 in number—Oude, Nagpoor, Pegu, Tenasserim; and the 3 detached settlements already mentioned in and near the straits of Malacca. The two other portions, occupying, between them, the entire space from Pegu to the Cis-Sutlej states, met near the confluence of the Gogra and the Ganges, Patna being situated in "Bengal," and Benares in "the north-western provinces." The "presidency" of B. is no longer an administrative division; the territory over which the lieutenant-governor of B. now rules is very nearly what used to be known as lower B., and comprises B. proper, Bahar, Orissa, including the tributary Mehals, Chota Nagpore, and the native states of Hill Tipperah and Kooch Bahar. The north-west provinces are no longer included in the government of B.; the Punjab has likewise an independent lieutenant-governor; Oude is under a chief commissioner; Pegu and Tenasserim are embraced in British Burmah; and since 1874 Assam too has its own chief commissioner.

According to the census of 1872, the areas and populations of the four great provinces that constitute B. in the wider sense, and are under the lieutenant-governor of B., are as follows:

	Square miles.	Inhabitants.
Bengal proper	78,982	34,277,342
Bahar	42,417	19,736,101
Chota Nagpore	28,482	3,419,561
Orissa	8,714	3,162,490
	158,595	60,595,524
Tributary states	38,324	2,218,296
Total	196,919	62,813,820

Thus the local government of B. has a population nearly twice as numerous as that of the United Kingdom. It extends from the meridian 82° to 92° e. of Greenwich, and lies within the parallels of 19° 40′ and 28° 10′ n. lat. It consists mainly of the lower plains of the Ganges, and the whole of the great delta, and comprises a portion of the valley of the Brahmapootra, and the sea-board district of Chittagong. Chota Nagpore and Orissa are beyond the western bounds of the plains of the Ganges.

In military matters, Hindustan is regarded as composed of the three presidencies of Bengal, Madras, and Bombay. When the army of B. is spoken of, we must therefore understand by B. a much larger area than that included in the above table. In 1871, the number of European soldiers in the army of B. was 35,122; native, about 65,000. Other features of B. as a presidency will fall naturally under more general heads. B. proper alone, the ancient soubah, or the modern province, now claims more special notice.

B. proper, then, is bounded on the n. by Nepaul, Sikim, and Bhotan; on the e. by Assam; on the s. by the bay of Bengal; on the s.w. by Orissa and Gundwana; and on the w. by Bahar. Taking its widest range, it measures about 350 m. from w. to e., by an average of about 300 from s. to n., and covers an area of 89,836 sq.m., embracing about 30 administrative districts. In 1871, the pop. was 36,769,735. Thus Bengal proper is somewhat smaller in extent and denser in population than Great Britain. Next to Calcutta, the cities of note are Moorshadabad, Dacca, Burdwan, Purneah, Hoogly, Midnapore, Rajmahal, Bancorah, Berhampore, etc. In B. proper, within the district of Hoogly, there stands also the French settlement of Chandernagore, containing somewhat less than 4 sq.m., with a pop. of about 33,000. The Hoogly district, moreover, contained, at one time, two other dependencies of foreign countries, the Dutch Chinsura, and the Danish Serampore, respectively ceded to England in 1824 and 1845. B. proper, as a whole, may be regarded as almost a dead level. It is only on the s.w. frontier that it shows any hill-country, for towards the n. it is said nowhere to reach even a single spur of the Himalaya. The principal rivers are the Ganges and the Brahmaputra, the former intersecting the country diagonally from n.w. to s.e., and the latter crossing its more easterly portion in a direction to the w. of south. During their lower courses, these main channels are so interlaced together as to form perhaps the most singular net-work of waters in the world; and their first point of confluence is said to be Jaffergunge—the head also of tide-water—in lat. 23° 52′ n., and long. 89° 45′ e., at a distance of 160 m. from the sea. But the thousand-isled delta commences 120 m. furthur up the Ganges, where

the highest offset, the Bhagirathi, breaks off to the right, afterwards to join a similar offset, the Jellinghee, in forming the Hoogly of Calcutta. Besides these two grand arteries, the province is watered by many less considerable rivers, chiefly northerly tributaries of the Ganges: so that even in the dryest season there is scarcely any spot 20 m. distant from a navigable stream. During the rainy months, almost every water-course in the more level regions inundates the adjacent plains; while, down in the delta, the separate floods sometimes mingle themselves into a breadth of 100 miles. To say nothing of temporary inconvenience and loss, these visitations often inflict permanent damage such as is wholly irreparable. The soil, in most parts of the province, is so decidedly alluvial, that hardly a rock or a stone meets the ascending voyager within a distance of 400 m. from the sea—a soil offering but a feeble barrier to torrents which, besides gathering, as they rise, velocity and momentum, are liable to change their direction with each increase of depth and width. A twofold evil is the result. The Ganges and the Brahmaputra, resuming, as it were, their gifts of a former age, cut for themselves new passages, to the injury of private individuals, while their old ones become so many seething swamps, to the prejudice of the public health. To a partial extent, such calamities have been averted by embankments. In these circumstances, the intercourse is ordinarily carried on by water: the Bengalee, in fact, may be viewed as almost amphibious; and on the Lower Ganges alone, there are said to be—unless in so far as steam may have reduced the number—about 30,000 professional boatmen. Speaking generally, the communications by land are merely beaten paths. The only exception of note—and that certainly a noble one—is the Grand Trunk road, which traverses the province from Calcutta upwards on its way to Delhi, Lahore, and the Indus. Much of the country is covered by thick woods and impenetrable jungles, which abound in wild animals, such as the jackal, the leopard, the tiger, and the elephant. The last is often tamed for domestic use, the more common beasts of burden being the camel and the horse, the latter of an altogether inferior variety. Lying, as B. proper does, between the 21st parallel and the 27th, its climate and productions, so far as the latitude alone is concerned, may be expected to be tolerably uniform over the entire province. But other causes intervene to affect the result. Thus, the nearer any place is to the sea, the heavier are the rains, and the broader is the overflow; the difference of moisture, however, being, in the remoter localities, often made up by irrigation. Moreover, in an inverse proportion to the latitude, the alternate monsoons of the bay of Bengal (see next article), with their respective influences on the thermometer and barometer, are more sensibly felt in the maritime tracts. Lastly, to these special causes must be added a cause of more general character—the difference of elevation. Hence, wheat and barley, for instance, grow only on the higher grounds, while rice cannot thrive unless within the range of the inundations, yielding, too, an endless diversity of varieties, according to the infinitely fluctuating conditions under which it may be cultivated. Besides grains and vegetables in great variety and abundance, B. proper gives to commerce opium, indigo, silk, sugar, tobacco, coffee, and cotton. See CALCUTTA. Cotton manufactures, once extensively carried on, particularly in the district of Dacca, have latterly given way to British competition. The article of salt, to come up under another head in connection with revenue, claims separate notice. Most of what is consumed in B. proper is made in deserts on the coast, alternately covered and abandoned by every tide, where the singularly powerful evaporation—said to be sometimes an inch a day on the depth of the adjacent bay—impairs the health of the laborer in proportion as it facilitates his labor. Of all these commodities, indigo (q.v.) is, in one important view, the most valuable, as being more likely than any other to attract English agriculturists to India. From the earliest times the dye appears to have been cultivated on the Lower Ganges, which for ages enjoyed, in this respect, the monopoly of the European trade. But when once the cultivation of the plant was introduced into America, it gradually engrossed the market—the greater care in the preparation making up for a natural inferiority in the article itself; and it was only when British capital and skill undertook the manufacture, that B. began to resume her original supremacy in this branch of agriculture. The annual rain-fall at Calcutta varies from 50 in. to 85, diminishing gradually towards the interior. At Calcutta also, in the year 1871, the mean temperature for May was 84° 12′; for July it was 83° 12′; and for Dec., 69° 48′. The prevailing winds were, from Jan. to May of the same year, n.w. to s.; from June to Sept., southerly; from Oct. to Dec., n.w. Iron and coal are understood to abound, though by no means continuously, in a tract as large as England, running to the w. from Rajmahal—a tract, however, not wholly situated in Bengal proper. In 1757, a single battle, gained against odds of twenty to one, transferred B. from the Mogul's viceroy to the English East India company—the Mogul's own grant of 1765 ratifying the decision of Plassy. B. has 10 colleges belonging entirely to the government, and 5 private colleges receiving grants-in-aid, which were attended in 1873 by 1163 students. There are 2 unaided colleges. In 1871–72, the government and aided schools numbered 4383, with 7292 teachers, and 163,280 pupils. Besides these there were 10,907 ascertained schools not receiving aid from the state, with 169,917 pupils. There is also a vast number of petty hedge schools, of which no statistics exist.

BENGAL, BAY OF, a portion of the Indian ocean, of the figure of a triangle, or rather of a quadrangle, for the northern extremity, instead of running to a point, measures about 250 m. from Balasore to Chittagong. Its southern side, drawn from Coromandel

to Malacca, so as merely to leave on the right both Ceylon and Sumatra, may be stated at 1200 miles. The bay of B. receives many large rivers—the Ganges and the Brahmaputra on the n., the Irrawaddy on the e., and on the w. the Mahanuddy, the Godavery, the Kistna or Krishna, and the Cauvery. On the w. coast, there is hardly anything worthy of the name of harbor; while on the e. there are many good ports—such as Aracan, Cheduba, Negrais, Syriam, Martaban, Tavay river, King's island, besides several more in the islands between Pegu and Sumatra. The evaporation, as stated in the previous article, sometimes amounts, in the hottest season, to about an inch a day. The monsoons prevail over the whole of the n. part of the Indian ocean, of which the bay of B. is a part, and also over the maritime tracts of B. itself. The n.e. monsoon is clearly the ordinary trade-wind of the northern hemisphere; while that from the s.w. is shown by Maury, in his *Physical Geography of the Sea*, to be a deflection of the ordinary trade-wind of the southern hemisphere. Generally speaking, the n.e. and s.w. monsoons prevail respectively in summer and winter. Maury, however, shows that, on different parallels, there are different seasons for the alternate changes.

BENGAL' ARMY. A succinct account of the military forces in India, European and native, will be found under EAST INDIA ARMY; including a notice of the changes made consequent on the transfer of the company's powers to the crown, in 1858.

BENGALI' LANGUAGE. See HINDUSTAN.

BENGAL' LIGHT, BLUE LIGHT, or BENGAL FIRE, is a brilliant signal-light used at sea during ship-wreck, and in ordinary pyrotechny for illuminating a district of country. It is prepared from niter, sulphur, and the tersulphuret of antimony. The materials are reduced to fine powder, thoroughly dried, and intimately mixed in the following proportions by weight: niter, 6; sulphur, 2; tersulphuret of antimony, 1. The mixture constitutes the B. L., and when kindled by a red-hot coal, red-hot iron, or flame, immediately bursts into rapid and vivid combustion, evolving a brilliant, penetrating, but mellow light, which, during the darkness of night, readily overcomes the gloom for a considerable space. As the fumes evolved during the combustion of the B. L. contain an oxide of antimony, and are poisonous, the light cannot be used with safety in rooms or inclosed spaces.

BENGA'ZI, a seaport t. of Barca, n. Africa, finely situated on the e. coast of the gulf of Sidra, in lat. 32° 6′ n., and long. 20° 2′ east. It has a pop. of about 7000, who carry on a trade with Malta and Barbary in oxen, sheep, wool, and corn. The value of exports in 1874 was £279,000. It has a castle, the residence of a bey, who governs it for the pasha of Tripoli. Its harbor is rapidly filling up with sand. There are here English, French, and Italian consuls. B. is chiefly interesting to the traveler, as having been the site of the ancient city of Hesperis, near which were several singularly luxuriant dells of large extent, inclosed within steep rocks rising to the height of 60 or 70 feet. These were supposed to answer well the description of the fabled gardens of the Hesperides. It first rose to importance under Ptolemy III., who called it Berenice, after his wife. It had then a large population, chiefly of Jews. Justinian afterwards fortified it.

BENGEL, JOHANN ALBRECHT, a distinguished German theologian and commentator, whose writings have exercised considerable influence in England, was b. at Winnenden, in Würtemberg, June 24, 1687. His early life was checkered by many vicissitudes. After completing his theological curriculum in 1707, he became curate of Metzingen; a year after, he was appointed theological tutor at Tübingen. Later in life, he held several high offices; among others, that of consistorial councilor and prelate of Alpirsbach, in Würtemberg, where he died Dec. 2, 1752. He was the first Protestant author who treated the exegesis of the New Testament in a thoroughly critical and judicious style. He did good service also in the rectification of the text of the Bible, and in paving the way for classifying the sacred manuscripts into families. The short notes in his *Gnomon Novi Testamenti* (Tübingen, 1742) have been generally regarded as valuable, and translated into various languages. They were especially made use of by John Wesley, in his *Notes on the New Testament*, which forms one of the standards of Wesleyan Methodism. Indeed Wesley's work may be regarded as little more than an abridged translation from Bengel. *An Exposition of the Revelation of St. John* (Stuttgard, 1740), and a chronological work—the *Ordo Temporum a Principio per Periodos Œconomiæ Divinæ Historicus atque Propheticus* (Tübingen, 1741), gained for B., in his time, a great reputation; some regarding him as an inspired prophet, but the majority as a visionary. In these works he calculated, on the basis he supposed to be laid down in the Apocalypse, that the world would endure for the space of 77777 years; and that the "breaking loose and the binding of Satan" would take place in the summer of 1836.

BENGUE'LA, a country of western Africa, the limits of which are not very definitely fixed. It is usually represented as lying between lat. 9° and 16° s., and long. 12° and 17° east. The river Coanza separates it from Angola on the n., the mountains behind cape Negro bound it on the s., and the Atlantic ocean on the west. Its surface is generally mountainous, rising from the coast-line inland, in a series of terraces; several important rivers flow through it in a n.w. direction to the Atlantic. These rivers have numerous affluents, and water is everywhere so plentiful that it may be found by digging 2 ft. beneath the surface. Vegetation of the most luxuriant and varied description is the

consequence of this humidity. The fruit-trees both of tropical and subtropical climates, succeed extremely well. The inhabitants, however, are too ignorant or indolent to take advantage of the productiveness of the soil. Animals of all kinds common to western Africa abound in B., both on land and in water. Peacocks are said to be accounted sacred in B., and kept tame about the graves of the great chiefs. Sulphur, copper, and petroleum are found in the mountains, and also gold and silver in small quantities. The coast is unusually unhealthy, but the interior is more salubrious. B. is inhabited by a variety of petty tribes, some of which are cannibals, and barbarous beyond even the barbarism of Africa. As might be anticipated, religion exists only in the form of fetichism. The Portuguese claim B., but they exercise no real power in the interior.

BENGUE'LA, ST. PHILIP DE, the Portuguese capital of the above region, on the Atlantic, near the mouth of the river Catumbella. Lat. 12° 33′ s., long. 13° 25′ east. It is very unhealthy; so inimical to European life, indeed, that the Portuguese affirm their countrywomen could not live three months in it. It has a miserable appearance, being built of half-baked bricks, and made ruinous-like by a practice that prevails of never repairing the houses, which, whenever they exhibit symptoms of decay, are abandoned for new ones erected in the vicinity. Pop. 3500, chiefly free blacks or slaves. It was a great slave-station at one time, exporting annually 20,000 slaves. The trade has fallen off greatly of late years. The town was, some time ago, invaded by a herd of thirsty elephants in quest of water, and almost entirely destroyed.

BENHAM, HENRY W., b. Conn.; a West Point graduate, in the engineering service in the war with Mexico, and wounded at Buena Vista. In 1861, brig.gen. of volunteers; his rank since 1867 being col. of engineers. He has been employed in the coast survey and the construction of harbor defences.

BENI' a river of South America, in the state of Bolivia, formed by the junction of all the streams that rush down from the eastern Andes between 14° and 18° s. latitude. Flowing through the department of its own name, it joins the Mamore to form the Madeira, one of the largest affluents of the Amazon.

BENICAR'LO, a poor, dirty, walled town of Spain, in the province of Valencia. Pop. 6000, who manufacture "full-bodied" wines for export to Bordeaux, where they are used in cooking clarets for the English market. Bad brandy is also manufactured here; and the town being situated on the Mediterranean, a little fishing is carried on.

BENICIA, the seat of justice of Solano co., Cal., and once capital of the state, on Carquinez strait, between Suisun and San Pablo bays, 30 miles n.e. of San Francisco; pop. '70, 1656. It has a good harbor, with steam communication with San Francisco. There are tanneries, flouring mills, and cement works; a collegiate institute, a law school, and St. Augustine (Episcopal) theological seminary. The U. S. military depot is here.

BE'NI-HAS'SAN, a village of upper Egypt, on the e. bank of the Nile, in lat. 27° 53′ n., and long. 30° 55′ east. The place is remarkable for the numerous grottoes in its vicinity, which are among the most interesting in Egypt. These catacombs are excavated in the calcareous bank—apparently, at one time, washed by the Nile—now flowing further w.—in which the low hills that rise in this part of the valley terminate. The catacombs are about thirty in number, and are supposed to have been used as sepulchres by the principal inhabitants of Hermopolis, a city that stood on the opposite side of the river. Some of the grottoes consist of three apartments, the largest of which is 60 by 40 ft.; and pillars are cut out of the rock in imitation of the columns that support the roofs of buildings. These shafts are polygons of sixteen sides, fluted except on the inner side, which is left smooth for a line of hieroglyphics. They are usually about 16 ft. high, and from 3 to 5 ft. in diameter at the base. The sides of the caverns are covered with paintings representing the industrial pursuits, sports, pastimes, etc., of the ancient Egyptians. The paintings, though not so artistic as those in the Theban catacombs, are of earlier date, and throw much light on the manners and customs of the people.

BE'NI-ISGUEN', a large t. in the interior of Algeria, surrounded by a rampart, flanked with towers, and said to be nearly as populous as Algiers. It has some trade in grain.

BE'NI-IS'RAEL (Sons of Israel), a remarkable race in the w. of India, who preserve a tradition of Jewish descent, and have from time immemorial acknowledged the law of Moses, although in many respects conforming to the idolatry of the Hindus by whom they are surrounded. Dr. Wilson estimates their whole number at not much more than 5000. Their original settlement was at Navagaum, about 30 m. from Bombay, where they were protected by the native princes; they have spread through the maritime parts of the Konkan, and some of them are now to be found in Bombay itself. Their features exhibit a resemblance to those of the Arabian Jews. Until recently, they were ignorant even of the names of many of the books of the Old Testament; and it was not without hesitation that they consented to receive those of the later prophets. Dr. Wilson supposes them to be a remnant of the ten tribes, and to have settled in India long before the Jews of Cochin. See COCHIN (HINDUSTAN). They reject the name of Jews, and deem its application to them a reproach. They have no MS. of the

law in their synagogues. Their communities are governed by a *mukadam*, or head-man of their own number; and their religious assemblies are presided over by a *kazi*, who also performs circumcision and other rites.

BENIN, a state in Guinea, Africa, above the mouth of the river Niger, situated in 4° to 9° n. lat., and 4° to 8° e. long. It takes its name from the western arm of the Niger—formerly supposed to be a main river, and styled *Benin* or *Formosa*—which leaves the Niger at Kirii, and, after a course of about 115 m., forms an embouchure two m. wide. The country of B. is bounded on the n.e. and the e. by the Niger; on the s. by the bay of Benin, into which cape Formosa is projected; on the w. by Dahomey; and on the n.w. by Yariba. The coast is indented by numerous estuaries, and is generally level; but the land gradually rises towards the north, until it reaches an elevation of 2500 feet in the Kong Mountains. The soil is very fertile, producing rice, yams, palms, sugar, etc. The animals are the same as those in other states of Guinea, but the hippopotamus is more common. The population is so dense that the king—who is worshiped as a great *fetich*—could, in its most flourishing days, bring into the field an army of 100,000 men. The government, customs, and superstitions of B. are like those of Ashantee. The kingdom has long been declining, and is now much broken up into independent states. The capital, Benin, situated in lat. 6° 20′ n., long. 5° 50′ e., with about 15,000 inhabitants, has a considerable trade. Messrs. Smith and Moffat, who visited it in 1838, describe its market-place as very offensive, from the effluvia rising from a heap of human skulls; while in the outskirts of the town they were still more revolted by the sight of turkey-buzzards feeding on bodies of men recently decapitated. At Gato, a harbor lower down the river, where the traveler Belzoni died, European merchants formerly had factories. Warree is another principal place. The export trade of B. consists of palm-oil, salt, blue coral, jasper, wild-beast skins, slaves, etc. B. was discovered by the Portuguese Alfonso de Aveiro, 1486. In 1786, the French founded settlements at the mouth of the river, which were destroyed by the British in 1792.

BENIN, Bight of, that portion of the gulf of Guinea (q.v.) extending from cape Formosa on the e. to cape St. Paul's on the w., a distance of about 390 m., with a coast-line of 460 miles. Several rivers empty themselves into the B. of B., the three principal of which, Benin, Escardos, and Forcados, are accessible to shipping. The coast along the Bight was blockaded in 1851 by the British fleet engaged in the suppression of the slave-trade. Palm-oil and ivory are the principal articles of trade at the towns on the coast.

BENI-SOUEF, a t. of Central Egypt, on the right bank of the Nile, about 70 m. s.s.w. of Cairo, one of the stations where travelers making the tour of Egypt usually stay. It is the entrepot of all the produce of the fertile valley of Fayoum, and has cotton-mills and alabaster quarries. Pop. 5000.

BENITIER, or Benatura, the name of the vase or vessel in which consecrated or "holy water" is held in Roman Catholic churches. In England the B. was known by the names of the "holy-water font," the "holy-water vat," "the holy-water pot," the "holy-water stone," the "holy-water stock," and the "holy-water stoup." Benitiers were either movable or fixed. Portable ones, commonly of silver, were used in processions. Fixed benitiers were placed near the doors of churches, so that the people might dip their fingers in the water, and cross themselves with it as they entered or left the church. The learned French ecclesiologist, M. Viollet-le-Duc, is disposed to think that, before the 12th c., there were no fixed-benitiers, their place being served by vases of metal set down near the entrance of the church when the doors were opened. The fixed B. is usually placed either against a pillar, or upon a pedestal. It is of all shapes, and is of the most different materials, but oftenest of stone. The benitiers belonging to the church of St. Sulpice, in Paris, are remarkable for their beauty. They are formed of magnificent shells, and bordered with gilt copper. In Great Britain, benitiers are found of every style, from Romanesque to late Third Pointed. On the continent, they range from Romanesque to Renaissance, those of the latter style being generally of marble, richly sculptured, and supported by figures.

BENJAMIN (a Hebrew proper name, signifying "son of my right hand," or "son of good fortune"), the youngest and most beloved of the sons of Jacob. His mother, Rachel, who died soon after he was born, called him *Benoni* (son of my pain), but his father changed it to Benjamin. He was the head of one of the twelve tribes of Israel. The tribe in the desert reckoned 35,400 warriors above twenty years of age; and on the entrance into Canaan, 45,600. Its territory, which was small but fertile, lay on the w. side of the Jordan, between the tribes of Ephraim and Judah. The chief places were Jericho, Bethel, Gibeon, Gilgal, and Jerusalem, the last of which was on the confines of Judah. In the time of "the Judges," the tribe of B. became involved in war with the eleven other tribes of Israel, on account of refusing to deliver up to justice the Gibeonitish ruffians who had brutally abused the concubine of an Ephraimite. The result was dreadful. All the male descendants of B. were put to the sword (Judges xx. and xxi), excepting 600, towards whom the hearts of their brethren finally relented. Saul, the first king of Israel, was of the tribe of B., which remained loyal to his son, Ishbosheth. After the death of Solomon, B., along with Judah, formed the

kingdom of Judah; and on the return from the captivity, these two constituted the principal element of the new Jewish nation.

BENJAMIN, JUDAH PETER, b. San Domingo, 1812, and came with his parents to Savannah in 1816. He studied at Yale, and began the practice of law in New Orleans. In 1852, he was elected U. S. senator as a whig, and in 1859 re-elected as a democrat. He was among the earliest of the secessionists in the congress of 1860–61, leaving the senate in February of the latter year, and becoming attorney-general of the confederacy. When the rebellion was suppressed, he left the country and has since resided in London, where he has an extensive practice in the law.

BENJAMIN, PARK, 1809–64; b. Demerara; graduate at Trinity college, Hartford; practiced law in Boston in 1832, and was an editor of the *New England Magazine*. In 1837, he removed to New York and became one of the editors of the *American Monthly Magazine*, and two years later assisted Horace Greeley in editing *The New Yorker*. In 1843 he was one of the editors of the *New World*, retiring in 1844. He wrote many poems, essays, reviews, etc.; but no collected edition of his works has been made. In person he was large and apparently very robust; but an early sickness deprived him of the use of his legs.

BENJAMIN OF TUDELA, a Jewish rabbi, was b. in Navarre, Spain. He was the first European traveler who gave information respecting the distant east. Partly with commercial views, and partly to trace the remnants of the "lost tribes," he made a journey, in the years 1159–73, from Saragossa, through Italy and Greece, to Palestine, Persia, and the borders of China, returning by way of Egypt and Sicily. He died in 1173, the last year of his travels. His notes of foreign lands—originally written in Hebrew, and frequently republished in Latin, English, Dutch, and French—are occasionally concise and valuable; but on the whole must be accepted with qualifications. Like all the early travelers, B. had a greedy ear for the marvelous. His errors are also numerous. The latest edition by Asher (London, 1841) contains the original text, with an English translation and learned annotations.

BENJAMIN TREE. See BENZOIN.

BEN LAWERS, a mountain in Perthshire, Scotland, about 32 m. w.n.w. of Perth, on the w. side of Loch Tay. This mountain, which is easy of ascent, is rich in specimens of Alpine plants, and a magnificent view is commanded from its summit, which has an elevation of 3984 feet. Ore of titanium is found in the mountain.

BEN LE'DI, a mountain also of Perthshire, 4 m. w.n.w. of Callander, with an elevation of 2882 feet. It received its name from the Druids, who are supposed to have had a place of worship on its summit—the Gaelic words *Beinn-le-Dia*, signifying "hill of God." This mountain is celebrated in Scott's *Lady of the Lake*.

BEN-LO'MOND, a celebrated Scottish mountain in the n.w. of Stirlingshire, on the e. side of Loch Lomond, and about 27 m. w.n.w. of Stirling. This mountain, forming the s. extremity of the Grampians or Central Scottish Highlands, is 3192 ft. high, and consists of mica slate, with veins of quartz, greenstone, and feldspar porphyry. The summit is precipitous on the n. side, with a gentle declivity on the s.e.; it is covered with vegetation to the top. Though considerably surpassed in height by several other Scottish mountains, none are more imposing. Seen from Loch Lomond, it appears a truncated cone, and from between Stirling and Aberfoyle, a regular pyramid. It has perhaps been ascended by a greater number of tourists than any other of the Highland mountains. The magnificent view from the top, in clear weather, includes the whole length (30 m.) of Loch Lomond, with its diversified isles, and wooded and cultivated shores, the rich plains of Stirlingshire and the Lothians, the windings of the Forth, the castles of Stirling and Edinburgh, the heights of Lanarkshire, the vales of Renfrewshire, Ayrshire, Firth of Clyde, isles of Arran and Bute, the Irish coast, Kintyre, and the Atlantic. The n. semicircle of the horizon is bounded by ben Lawers, Voirlich, Ledi, Cruachan, and Nevis; while some of the beautiful Perthshire lochs are seen.

BEN MACDHUI, a lofty mountain of Aberdeenshire, belonging to the Grampian range, at one time regarded as the highest in Great Britain, but now ascertained to be the second—its elevation being 4296 feet.

BENNET, HENRY, earl of Arlington, 1618–85; a distinguished English statesman in the reign of Charles II. In the beginning of the civil war he was under-secretary to lord Digby, the secretary of state. He afterwards volunteered in the royal cause, and did good service, especially at Andover, where he was wounded. He was made secretary to the duke of York; in 1658, knighted by Charles, at Bruges, and sent as envoy to the court of Spain. On the king's return to England, B. was called home, and made keeper of the privy purse and principal secretary of state. In 1670, he was one of the council that got the nickname of the "cabal," and one of those who advised shutting up the exchequer. In 1672, he was made earl of Arlington and viscount Thetford, and soon afterwards a knight of the garter. His *Letters to Sir William Temple* were published after his death.

BENNETT, JAMES GORDON, b. Scotland, Sept. 1, 1795, d. N. Y., June 1, 1872. He was intended for the priesthood by his parents, who sent him to a Roman Catholic sem-

inary; but in 1819, he migrated to America, and began teaching in Halifax, N. S. In the autumn of that year, he reached Boston and took the situation of proof-reader in a publishing house, and while there made his first literary venture in fugitive poems. In 1822, he was on the *Charleston Courier* as Spanish translator and special writer. Coming to New York, he undertook to start a commercial school, but abandoned the idea and took to lecturing on political economy. In 1825, he owned the *New York Courier*, a short-lived Sunday journal. Then he became a casual reporter and writer, now technically called a "Bohemian;" in 1826, he obtained regular employment on Snowden's *National Advocate*, and was active as a politician. In 1827, he wrote for the *New York Enquirer*, edited by Mordecai B. Noah, and in 1828 was its Washington correspondent. The next year the *Enquirer* was united to the *Courier*, and in the autumn B. became associate editor of the *New York Courier and Enquirer*. In 1832, in consequence of a difference of opinion about the U. S. bank between him and James Watson Webb, the responsible editor, B. left the *Courier and Enquirer*, and in October issued the *New York Globe*, which lived four weeks. He next appeared as a share-owner in the *Pennsylvanian*, of Philadelphia, and in 1833 was chief editor. In 1834, he returned to New York, and on Wednesday morning, May 6, 1835, he issued from the basement of No. 20 Wall street, No. 1 of the *Herald*, price one cent. It had four pages of four columns each, the whole surface of print being a little less than 3½ sq.ft., of which one quarter was occupied by advertisements. The *Herald* issues now (1880) on Sundays occasionally sheets of 24 pages of 6 columns, or 144 columns, having a printed surface of 48 sq.ft., of which two thirds are taken by advertisers. The cost of advertising in the first number was 50 cents for 16 lines; at present the same number of lines costs $6.40. In the opening editorial, B. announced his independence of parties, cliques, and factions, and proposed to publish simply an independent newspaper. On the 11th of the month the second number was issued, and contained the "money," or "Wall street" article, a department now indispensable to a morning newspaper in any commercial city. For some time all the editorials, reports, etc., were written by the editor himself, who often wrote in the first person, and with a pungency that secured attention and circulation. He took immediate advantage of ocean steamers and the telegraph to secure news, and his paper reported through Morse's experimental wires the first speech ever sent by telegraph to any journal, that of John C. Calhoun on the war with Mexico. The *Herald* was the first daily paper to issue on Sundays, and the first to publish on every day in the year. Hesitating at no trouble or expense, and availing himself of the steamship, the telegraph, the horse-express, and the post-office, B. soon made the *Herald* widely known as what he meant it to be—a newspaper, to increase the importance and value of which was the sole ambition of his life. He left two children, a daughter and James Gordon, Jr., bequeathing the *Herald* entire to the son, who continues it with the spirit and enterprise of the founder.

BENNETT, JOHN HUGHES, 1812–75; b. London. He was educated at Exeter and Edinburgh, and studied in Paris and Germany. He was for 26 years professor of the institutes of medicine in Edinburgh university. He was an able teacher, and his original investigations entitle him to a high place in the history of medicine. His best known publications are *Clinical Lectures, Treatise on Physiology*, and *Text-Book of Physiology*.

BENNETT, Sir WILLIAM STERNDALE, MUS.D., D.C.L., English pianist and composer, was b. at Sheffield, April 13, 1816. After studying under Crotch, Holmes, and Potter, in the royal academy, London, he attracted the notice of Mendelssohn at the Düsseldorf musical festival, appeared with success at Leipsic in the winter of 1837–38, and was received with great applause when he returned to London. In 1838, he was elected member of the royal society of music. In 1856, he succeeded Mr. Walmsley as professor of music at Cambridge. At the opening of the international exhibition, 1862, Tennyson's ode, *Uplift a Thousand Voices*, set to music by B., was fervidly sung. In 1868, he was appointed principal of the royal academy of music; and was knighted in 1871. He died in 1875.

BEN NEVIS, the highest mountain in Great Britain, is situated in the co. of Inverness, Scotland. It has a height of 4406 ft., is exceedingly difficult of ascent, with a tremendous precipice of 1500 ft. in depth on the n.e. side. Here snow remains throughout the year. Granite and gneiss form the base of the mountain, which in its upper part is composed of porphyry.

BENNIGSEN, LEVIN AUG. THEOPHILUS, Count, one of the most famous Russian generals, was b. at Brunswick, Feb. 10, 1745. His father was an officer in the Brunswick guards; and B. himself entered the Hanoverian service for a time; but having squandered the property left him, he joined the Russian army in 1773, and in the Turkish war soon attracted the notice of the empress, Catherine, who employed him to carry out her designs against Poland. He was one of the leaders of the conspiracy against the emperor Paul (1801); though he is said not to have been present at the catastrophe, but to have prevented the empress Maria from rushing to her husband when she heard his cries. He fought with considerable success in the battle of Pultusk (1806), and held the chief command in the obstinate and murderous struggle at Eylau (1807). When Napoleon invaded Russia in 1812, B. commanded the Russian center on the bloody field of Borodino, and gave his voice for fighting a second battle before the walls of Moscow.

Before the French began their retreat, he gained a brilliant victory over Murat at Wcronowa (Oct. 18th). Differences with Kutusov, who would not adopt B.'s plan to prevent the French from crossing the Beresina, made him retire from the army; but after Kutusov's death, he took the command of the Russian army of reserve, which entered Saxony in July, 1813, fought victoriously at the battle of Leipsic, and was created count by the emperor Alexander on the field. When Leipsic was taken, it was he that was commissioned by the allies to announce to the king of Saxony that he was a prisoner. Failing health made him retire from the Russian service in 1818 to his paternal estate in Hanover, where he died Oct. 3, 1826.—His son, ALEX. LEVIN B., became a leading Hanoverian statesman.

BENNINGSEN, RUDOLF VON, b. 1824; a Hanoverian statesman who was elected in 1866 (after the annexation) to the North German diet and the Prussian assembly, becoming vice-president of both bodies and a prominent liberal leader. He has also superintended the administration of government in the province of Hanover.

BENNINGTON, a co. in s.w. Vermont, on the Massachusetts and New York lines; drained by Hoosac river, reached by the Rensselaer and Saratoga railroad; 700 sq.m.; pop. '80, 21,945. It is famous for quarries of fine marble, and is a good agricultural region. Co. seats, Bennington and Manchester.

BENNINGTON, a t. in B. co., Vt., 35 m. n.e. of Albany, N. Y., on the Harlem Extension railroad; pop. '80, 6,333. It has important manufactories of parian ware and porcelain from materials abundant in the neighborhood. There is an observatory on Mt. Anthony, near the village. The "battle of B." was fought Aug. 16, 1777, when gen. Stark, leading a force of New Hampshire militia, defeated col. Baum and a detachment of Burgoyne's army. The English lost 200 killed, 600 prisoners, and 1000 stands of arms; the Americans lost 14 killed and 42 wounded.

BEN-RHYD'DING, a celebrated hydropathic establishment in the West Riding of Yorkshire, in a beautiful situation on the right bank of the river Wharf, 16 m. n.w. of Leeds. The building, erected in 1846 at the cost of nearly £30,000, is a very imposing pile, on an eminence midway up the side of the valley. There is accommodation for a large number of patients and visitors, and extensive pleasure grounds around. In addition to the usual appliances of the water-cure, and a variety of gymnastic exercises, Dr. M'Leod (who died in 1875) introduced the compressed-air bath (q.v.); and some time ago, a sumptuous Turkish bath was added to the other attractions of the establishment.

BEN'SHIE, or BAN'SHEE, an imaginary being in the superstitions of the Irish. The B. is a female, who is called the wife of the fairies, and she makes herself known by wailings and shrieks, premonitory of a death in the family over which she is presumed to exercise a kind of guardianship. The name of this tutelary demon is supposed to be from the Irish Celtic *ben* or *bean*, a woman; and *sighe*, a fairy. A similar superstition prevailed, and is perhaps not yet extinct, in the highlands of Scotland.

BENSON, JOSEPH, 1748–1821; an English preacher; he was educated for the established church, but became a Methodist and succeeded Wesley as president of the conference of the church. He was editor of the *Wesleyan Magazine*, and author of three works in especial defense of the Methodists, *Sermons on Various Occasions*, *Life of John Fletcher*, and *Commentary on the Holy Scriptures*.

BENT, a co. in e.s.e. Colorado, on the Kansas border, bounded on the s. by the Arkansas river, and intersected by the Kansas Pacific, and the Atchison, Topeka and Santa Fe railroads; pop. '70, 592; in '80, 1674. The surface is level. Productions chiefly agricultural. Co. seat, Las Animas.

BENT GRASS, *Agrostis*, a genus of grasses, distinguished by a loose panicle of small, one-flowered, laterally compressed spikelets; the glumes unequal, awnless, and longer than the paleæ, which are also unequal, and of which the inner one is sometimes wanting, and the outer sometimes has and sometimes has not an awn; the seed free. (For explanation of these terms, see GRASSES.) The species are numerous, and are found in almost all countries and climates; several are natives of Britain. All of them are grasses of a slender and delicate appearance. Some are very useful as pasture-grasses and for hay, upon account of their adaptation to certain kinds of soil, although none of them is regarded as very nutritious.—The common B. G. (*A. vulgaris*) forms a principal part of the pasture in almost all the elevated districts of Britain, and is equally abundant in many parts of the continent of Europe. It resists drought better than almost any other grass, but is only sown by agriculturists on soils unsuitable for the more luxuriant grasses. It is also regarded as very suitable for lawns; but in light, dry, cultivated grounds, it is often a troublesome weed, known as black squitch, or quick-grass, and frequent harrowing is resorted to for the removal of its creeping perennial roots. It is as frequent on wet as on dry soils, and varies much in size and appearance.—The marsh B. G. (*A. alba*), also very common in Britain, forming a large part of the natural pasture in many moist situations, is very similar to the species just described, but generally taller and stouter. Of this also there are many varieties, but, in all of them, the *ligule* (the little membranous tongue at the junction of the blade of the leaf with its sheathing base) is elongated and acute, whilst in *A. vulgaris* it is very short, and appears as if cut

off. A variety, so little different as scarcely to deserve the name, but with somewhat broader leaves and more luxuriant habit of growth, was at one time much celebrated among agriculturists, under the name of florin grass, or *agrostis stolonifera*. It was unduly lauded, and the consequent disappointment led to its being unduly disparaged. It is a useful grass in moist grounds, newly reclaimed bogs, or land liable to inundation. The first three or four joints of the culms lie flat on the damp soil, emitting roots in abundance, and it was formerly propagated by chopping these into pieces, and scattering them, but now generally by seed.—Herd grass (*A. dispar*) is a native of the United States, with broader leaves than either of the preceding species, very creeping roots, and large panicles almost level at top. It was at one time strongly recommended for cultivation, but has gone out of repute in Britain. It is, however, more highly esteemed in France, particularly upon account of the great crop which it yields on deep sand and on moist calcareous soils.—Brown B. G. (*A. canina*), a common perennial British grass, abundant in moist heaths and moorish grounds, is valuable for mixing with other grasses to form permanent pasture on poor wet peaty soils.—Silky B. G. (*A. spici venti*) is a beautiful grass, with very slender branches to its ample panicle, which, as it waves in the wind, has a glossy and silky appearance. It is a rare native of sandy grounds in England, common in southern and central Europe; an annual grass, occasionally sown in spring to fill up blanks in grass-fields.

BENTHAM, JEREMY, an eccentric but eminent writer on ethics and jurisprudence, was the son of a wealthy solicitor in London, where he was born (in Red Lion street, Houndsditch) on the 15th Feb., 1748. He received his early education at Westminster school; and, when yet a boy, being little more than twelve years of age, he went to Queen's college, Oxford, where he took his master's degree in 1766. But though his years were so tender, he appears not to have been so unprepared as might be supposed to benefit by the university; for before entering it, he had already, by his precocious tendencies to speculation, acquired the title of "philosopher." On graduating, his father, who expected his son to become lord chancellor, set him to the study of the law at Lincoln's inn, where he was called to the bar in 1772. He never practiced in his profession, however, for which he had a strong distaste, which is paraded in many of his writings. Turning from the practice of law to its theory, he became the greatest critic of legislation and government in his day. His first publication, *A Fragment on Government*, 1776, was an acutely hypercritical examination of a passage in Blackstone's *Commentaries*, prompted, as he has himself explained, by "a passion for improvement in those shapes in which the lot of mankind is meliorated by it." The *Fragment* abounds in fine, original, and just observation; it contains the germs of most of his after-writings, and must be highly esteemed, if we look away from its disproportion to its subject and the writer's disregard of method. The *Fragment* procured him the acquaintance of lord Lansdowne, in whose society at Bowood he afterwards passed perhaps the most agreeable hours of his life. It was in the Bowood society that he conceived an attachment to Miss Caroline Fox (Lord Holland's sister), who was still a young lady, when B., in the 54th year of his age, offered her his heart and hand, and was rejected "with all respect." In 1778, he published a pamphlet on *The Hard Labor Bill*, recommending an improvement in the mode of criminal punishment; which he followed in 1811 by *A Theory of Punishments and Rewards*. In these two works, B. did more than any other writer of his time to rationalize the theory of punishments by consideration of their various kinds and effects, their true objects, and the conditions of their efficiency. He published, in 1787, *Letters on Usury;* in 1789, *Introduction to the Principles of Morals and Legislation;* in 1802, *Discourses on Civil and Penal Legislation;* in 1813, *A Treatise on Judicial Evidence;* in 1817, *Paper Relative to Codification and Public Instruction;* in 1824, *The Book of Fallacies*. These were followed by other works of less consequence. His whole productions have been collected and edited by Dr. Bowring and Mr. John Hill Burton, and published in eleven volumes. It is well, however, for B.'s reputation, that it does not rest wholly on his collected works; and that he found in M. Dumont, Mr. James Mill, and sir Samuel Romilly, generous disciples to diffuse his principles and promote his fame. In his early works, his style was clear, free, spirited, and often eloquent; but in his later works it became repulsive, through being overloaded and darkened with technical terms. It is in regard to these more especially that M. Dumont has most materially served his master by arranging and translating them into French, through the medium of which language B.'s doctrines were propagated throughout Europe, till they became more popular abroad than at home. Mr. James Mill, himself an independent thinker, did much in his writings to extend the application in new directions of B.'s principles, a work in which, apart from his original efforts, he has achieved a lasting monument of his own subtilty and vigor of mind. Criticisms of B.'s writings will be found in the *Edinburgh Review*, by sir Samuel Romilly, and in the *Ethical Dissertation* (*Encyclopædia Britannica*, 7th and 8th eds.), by sir James Mackintosh. But the most valuable contribution in English to his reputation is unquestionably *Benthamiana*, by Mr. John Hill Burton, advocate, containing a memoir, selections of all the leading and important passages from his various writings, and an appendix embracing an essay on his system, and a brief clear view of all his leading doctrines.

In all B.'s ethical and political writings, the doctrine of utility is the leading and

pervading principle; and his favorite vehicle for its expression is the phrase, "the greatest happiness of the greatest number," which was first coined by Priestley, though its prominence in politics has been owing to Bentham. "In this phrase," he says, "I saw delineated for the first time a plain as well as a true standard for whatever is right or wrong, useful, useless, or mischievous, in human conduct, whether in the field of morals or politics." In need scarcely be remarked that the phrase affords no guidance as to how the benevolent end pointed at is to be attained; and is no more than a quasi-concrete expression of the objects of true benevolence. In considering how to compass these objects, B. arrived at various conclusions, which he advocated irrespective of the conditions of society in his day, and of the laws of social growth which, indeed, neither he nor his contemporaries understood. He demanded nothing less than the immediate remodeling of the government, and the codification and reconstruction of the laws; and insisted, among other changes, on those which came at a later day to be popularly demanded as the points of the "charter"—viz., universal suffrage, annual parliaments, vote by ballot, and paid representatives. However impossible some of these schemes were, it cannot be denied that B. did more to rouse the spirit of modern reform and improvement in laws and politics, than any other writer of his day. Many of his schemes have been, and many more are, in the course of being slowly realized; the end and object of them all was the general welfare, and his chief error—apart from his overestimate of the value of some changes which he proposed—lay in conceiving that organic changes are possible through any other process than that of growth and modification of the popular wants and sentiments. It was this error that led the philosopher, in his closet in London, to devise codes of laws for Russia (through which country he made a tour in 1785) and America, the adoption of which would have been equivalent to revolutions in these countries, and then bitterly to bewail the folly of mankind when his schemes were rejected.

In ethics, as in politics, he pressed his doctrines to extremes. It has been said that his doctrine of utility was so extended that it would have been practically dangerous, but for the incapacity of the bulk of mankind for acting on a speculative theory.

By the death of his father in 1792, B. succeeded to property in London, and to farms in Essex, yielding from £500 to £600 a year. He lived frugally, but with elegance, in one of his London houses (Queen square, Westminster); and, employing young men as secretaries, corresponded and wrote daily. By a life of temperance and industry, with great self-complacency, in the society of a few devoted friends (who, says sir James Mackintosh, more resembled the hearers of an Athenian philosopher than the proselytes of a modern writer), B. attained to the age of 84. He died in June, 1832.

BENTHAMIA, a genus of plants of the natural order *cornaceæ* (q.v.), consisting of Asiatic trees or shrubs, of which the fruit is formed of many small drupes grown together. *B. frugifera*, a native of Nepaul, is a small tree, with lanceolate leaves, and a reddish fruit, not unlike a mulberry, but larger; not unpleasant to the taste. It has ripened fruit in the s. of England, and will probably be found to succeed in the open air, wherever the winters are so mild that fuchsias are not cut down by frost. The flowers are fragrant.

BENTINCK, Lord WILLIAM GEORGE FREDERICK CAVENDISH, commonly called lord George B., at one time the leader of the agricultural protection party, third son of the fourth duke of Portland, was born 27th Feb., 1802, and entering the army when young, eventually attained the rank of maj. He subsequently became private secretary to his uncle, the right hon. George Canning. Elected in 1826 M.P. for Lynn-Regis, he sat for that borough till his death. At first, attached to no party, he voted for Catholic emancipation and for the principle of the reform bill, but against several of its most important details, and in favor of the celebrated Chandos clause (q.v.). On the formation of sir Robert Peel's ministry in Dec., 1834, he and his friend lord Stanley, afterwards earl of Derby, with some adherents, formed a separate section in the house of commons. On the resignation of sir Robert Peel in April following, lord George openly joined the great conservative party, which acknowledged that statesman as its head, and adhered to it for nearly eleven years. On Peel's return to power in 1841, lord George received an offer of office, which he declined, being at that time deeply interested in the sports of the field and the race-course. When Peel introduced his free-trade measures in 1845, a large portion of his supporters joined the protection party then formed, of which lord George became the head, and a leading speaker in the debates. His speeches in the session of 1845–46 were most damaging to the government of sir Robert Peel, and contributed in no small degree to hasten its downfall in July of the latter year. Lord George supported the bill for the removal of the Jewish disabilities, and recommended the payment of the Roman Catholic clergy by the landowners of Ireland. In the sporting world he is understood to have realized very considerable gains, and he showed the utmost zeal at all times to suppress the dishonest practices of the turf. He died suddenly of a spasm of the heart, 21st Sept., 1848, while crossing his father's park at Welbeck Abbey, Nottinghamshire.

BENTINCK, Lord WILLIAM HENRY CAVENDISH, a general officer and statesman, uncle of the preceding, and second son of the third duke of Portland, was born 14th Sept.,

1774, and became an ensign in the Coldstream guards in 1791. Having served with distinction in Flanders, Italy, and Egypt, he was in 1803 appointed governor of Madras, where he advocated several useful reforms; but his proscription of beards and the wearing of turbans and earrings by the sepoys when on duty, led to the mutiny and massacre of Vellore, and his own immediate recall. In Aug., 1808, he was placed on the staff of the army in Portugal under sir Harry Burrard. Subsequently selected to proceed on an important mission to the supreme Junta of Spain, he accompanied the army under sir John Moore in its retreat, and at Corunna commanded a brigade. He next commanded a division of lord Wellington's army, and shortly after was sent as British minister to the court of Sicily, and commander-in-chief of the British forces in that island. At the head of an expedition, he landed in Catalonia in July, 1813, penetrated to Valencia, and afterwards laid siege to Tarragona, but was repulsed at Villa Franca. Early in 1814, quitting Sicily, he repaired to Tuscany, published at Florence a proclamation inviting the Italians to shake off the French yoke, and afterwards made himself master of Genoa. Between 1796 and 1826, he held a seat in parliament as member for Camelford, Nottinghamshire, and Ashburton. In 1827, he was appointed gov.gen. of India, and sworn a privy-councilor. His policy in India was pacific and popular, and his viceroyship was marked by the abolition of sutti (q.v.), and by the opening up of the internal communication, as well as the establishment of the overland route. After his return in 1835, he was elected M.P. for Glasgow. He died at Paris, June 17, 1839.

BENTIVOGLIO, GIOVANNI; 1438–1508; chief magistrate of Bologna, while it was a republic, continuing his father's rule with great severity; but "his encouragement of the fine arts and his decoration of the city by sumptuous edifices, gilded his usurpation." He was expelled by pope Julian II. in 1506, and died in Milan.

BENTLEY, RICHARD, a distinguished classical scholar, was b. at Oulton, in Yorkshire, Jan. 27, 1662. In 1676, he entered St. John's college, Cambridge, in the humble capacity of subsizar. Little is known of his university career, except that he showed early a strong taste for the cultivation of ancient learning. At the usual time, he took the degree of bachelor of arts; and on leaving the university, he was appointed headmaster of the grammar-school of Spalding, Lincolnshire. About a year afterwards, he resigned this situation to become tutor to the son of Dr. Stillingfleet, then dean of St. Paul's, and subsequently bishop of Worcester. B. accompanied his pupil to Oxford, where he had full scope for the cultivation of classical studies; and that he succeeded in acquiring there some local reputation, is evinced by his having been twice appointed to deliver the Boyle lectures on the evidences of natural and revealed religion. He entered the church, and owed to the patronage of the bishop of Worcester various good ecclesiastical appointments, and through the same influence became librarian of the king's library at St. James'. In 1690, he published his *Dissertation upon the Epistles of Phalaris*, which established his reputation throughout Europe, and may be said to have commenced a new era in scholarship. The principles of historical criticism were then unknown, and their first application to establish that the so-called epistles of Phalaris, which professed to have been written in the 6th c. B.C., were the forgery of a period some eight centuries later, filled the learned world with astonishment.

In 1700, B. was appointed master of Trinity college, Cambridge; and in the following year, he married Mrs. Joanna Bernard, the daughter of a Huntingdonshire knight. The history of B.'s mastership of Trinity is the narrative of an unbroken series of quarrels and litigations, provoked by his arrogance and rapacity, for which, it must be confessed, he was fully as well known during his lifetime as for his learning. He contrived, nevertheless, to get himself appointed regius professor of divinity, and, by his boldness and perseverance, managed to pass scathless through all his controversies. Notwithstanding that at one time the bishop of Ely, the visitor of Trinity, pronounced sentence depriving him of his mastership, and that at another the senate of the university pronounced a similar sentence of his academic honors, he remained in full possession of both the former and the latter till the day of his death. This stormy life did not impair his literary activity. He edited various classics—among others, the works of Horace—upon which he bestowed vast labor. He is, however, more celebrated for what he proposed than for what he actually performed. The proposal to print an edition of the Greek New Testament, in which the received text should be corrected by a careful comparison with all the existing MSS., was then singularly bold, and evoked violent opposition. He failed in carrying out his proposal; but the principles of criticism which he maintained have since been triumphantly established, and have led to important results in other hands. He is to be regarded as the founder of that school of classical criticism of which Porson afterwards exhibited the chief excellences, as well as the chief defects; and which, though it was itself prevented by too strict attention to minute verbal detail from ever achieving much, yet diligently collected many of the facts which men of wider views are now grouping together, to form the modern science of comparative philology. B. died in 1742, leaving behind him one son, Richard, who inherited much of his father's taste with none of his energy, and several daughters, one of whom, Joanna, married, and was the mother of Richard Cumberland, the dramatist.—Monk's *Life of Richard Bentley*, 1830.

BENTON, a co. in n.w. Arkansas, bordering on Missouri and the Indian territory; 900 sq.m.; pop. '80, 25,419—196 colored. The chief business is agriculture. Co. seat, Bentonville.

BENTON, a co. in Indiana, bordering on Illinois; intersected by the Bloomington division of the Wabash, and the Cincinnati, Lafayette and Chicago railroads; 414 sq.m.; pop. '70, 5615. It has fertile prairie soil, with some forests. Co. seat, Oxford.

BENTON, a co. in Iowa, on the Cedar and Iowa rivers; intersected by the Burlington, Cedar Rapids and Northern, and the Chicago and Northwestern railroads; 720 sq.m.; pop. '75, 22,807; in '80, 24,888. Its surface is undulating prairie and woodland; chief business, agriculture. Co. seat, Vinton.

BENTON, a co. in Minnesota on the Mississippi river; intersected by the St. Paul and Pacific railroad; 400 sq.m.; pop. '75, 1974; in '80, 3017. It is an agricultural region, drained by St. Francis, Elk, and Little Rock rivers. Co. seat, Sauk Rapids.

BENTON, a co. in Mississippi on the Tallahatchie river and the Tennessee border; recently organized. Co. seat, Ashland.

BENTON, a co. in Missouri on the Osage river and its tributaries; 770 sq.m.; pop. '70, 16,322—320 colored. It is a good agricultural region, and has lead mines. Co. seat, Warsaw.

BENTON, a co. in Oregon, between Willamette river and the Pacific ocean; 1200 sq.m.; pop. '80, 6,403. The surface is mountainous, but good for grazing and the hardier grains. Co. seat, Corvallis.

BENTON, a co. in n.w. Tennessee on the T. river; crossed by the Nashville and Northwestern railroad; 400 sq.m.; pop. '70, 8234—452 colored; in '80, 9856; a good agricultural region. Co. seat, Camden.

BENTON, Thomas Hart, b. N. Y., Mar. 14, 1782; d. Washington, April 10, 1858. His family went to Tennessee, where he studied law and was elected to the legislature, where his first work was to reform the judiciary and to secure to slaves the right of trial by jury. In the war with England, B. was one of Jackson's aids, and raised a regiment of volunteers. In 1815, B. settled in St. Louis, and established the *Missouri Inquirer*, a journal that occasioned for him a number of duels, in one of which he killed his opponent. He advocated the admission of Missouri as a slave state, and after the famous compromise in 1820, was chosen U. S. senator. He was regularly re-elected, so that he was senator for 30 successive years, during all of which period he was conspicuous as a leader on almost every important question. One of his long prosecuted plans was to amend the constitution so that the people could vote directly for president, or come as near as possible to such a system. This project he brought forward several times, but it never came near adoption, all friends of caucus nominations and secret machine work in politics naturally opposing it. One of his hardest fights was in opposing the re-chartering of the U. S. bank, when he advocated the establishment of a currency of gold and silver only, for which idea he was long called "Old Bullion." After the charter had passed and president Jackson had vetoed it, the senate adopted a resolution censuring the president; but B., not long after, moved to expunge that resolution from the record, and carried his point after a long and fierce contest. Among other measures advocated by B. were the pre-emption of public lands, a railroad to the Pacific, the abolition of the salt-tax, and opening mineral lands to settlement. In the Oregon boundary question with Great Britain he took a leading part against the "fifty-four forty or fight" advocates, and his influence greatly conduced to the retreat of Polk's administration from an extreme position. He opposed the compromise measures of Henry Clay in 1850, and they were defeated as a whole, but adopted separately. He was friendly with Calhoun until the nullification episode, and thenceforth for a long period his enemy. Two years after his long service in the senate, B. was chosen to the other house, where he opposed the Kansas-Nebraska bill and failed of re-election on that account. In 1856, he was a candidate for governor of Missouri, through a "Native American" side issue. At the same election he supported Buchanan for president, although his own son-in-law, Fremont, was the opposing candidate. Col. Benton's *Thirty Years' View* is a well known and valuable political retrospect of his experiences and observations in the senate. He also made an *Abridgment of the Debates in Congress from* 1789 *to* 1856, in 15 large volumes.

BENTONVILLE, a village in Johnston co., N. C., where, Mar. 16, 1865, the confederates under Johnston undertook to capture the left wing of Sherman's army, then on the "march to the sea." They were resisted by gen. Slocum and Kilpatrick's cavalry, and failed. The union loss in killed and wounded was 1600; confederate loss not known, but there were 267 dead on the field and 1600 prisoners. Pop. '80, 1,076.

BENT TIMBER, produced by a modern method; usually made of planks bent to the desired curve and fastened together to form beams. A beam thus formed is stronger than if bent in a whole piece. At first the timber was steamed, but that course has been generally abandoned, as the steam injures the wood.

BE'NUE, or Bi'nué, or, as Dr. Barth prefers to spell it, Be'nuwé, called also Chadda and Tchadda, from the erroneous supposition that it was connected with lake

Tchad; an important river of central Africa, forming the eastern branch of the Quorra or Niger, which it joins about 230 m. above the mouth of that river in the gulf of Guinea. At its junction with the Faro, in lat. about 9° 33′ n., long. 12° 40′ e., the point where Dr. Barth crossed, he describes the B. as being 800 yds. across, with a general depth in its channel of 11 ft. and "a liability to rise under ordinary circumstances at least 30 ft., or even at times 50 ft. higher." In 1854, an expedition under the command of Dr. Baikie explored the B. as far as Dulti, a place about 350 m. above its confluence with the Niger, and some 80 or 100 m. from where Dr. Barth crossed. Dr. Barth regards this river as offering the best channel for the introduction of civilization into the heart of central Africa seeing that the tract of land which separates the basins of the B. and the Shari, which flows into lake Tchad, "cannot exceed 20 m., consisting of an entirely level flat, and probably of alluvial soil. . . . The level of the Tsad, and that of the river B. near Gewe, where it is joined by the Mayo Kebbi, seem to be almost the same." In the second expedition, undertaken in 1862, Dr. Baikie explored as far n. as Kano, in Haussa. The expedition of Dr. Nachtigall made in 1872 did not add much to our previous knowledge.

BENYOWSKY, MAURICE AUGUSTUS, Count de, a man of remarkable character and extraordinary fortunes, was born at Verbowa, in Hungary, 1741. He served in the seven years' war, and during his youth displayed that restless love of adventure which marked his subsequent career. He went to Dantzic for the purpose of studying navigation, and from thence made several voyages to Hamburg and Plymouth. When about to start for the East Indies in 1767, he received a pressing invitation to join the Polish confederation, with which he complied, and shared most of the dangers and glories of the campaign against the Russians until he was taken prisoner in May, 1769. After being transferred from one Russian prison to another, he was, in Dec., 1769, banished to Siberia, and from thence, in a few months, to Kamtchatka. During the voyage his exertions and skill saved the vessel that carried him. This recommended the prisoner to the governor, Nilov, who was further pleased by B.'s skill as a chess-player, and made him tutor in his family. In this capacity he gained the affections of Aphanasia, daughter of the governor, by whom he was assisted in his plans for escape; which, however, was not effected without a struggle, in which the governor was killed. B., with ninety-six companions, in a ship well armed and provisioned, and with a considerable amount of treasure, set sail from Kamtchatka in May, 1771. Having visited some of the islands of Japan and Formosa, B. arrived at Macao on the 22d of Sept., where he remained until the 14th Jan., and then sailed for France. He had not been here long when the French government proposed that he should found a colony at Madagascar, and he at once acquiesced. B. arrived on the island in Feb., 1774, and was made king in 1776 by the chiefs in conclave, he adopting the native costume. Returning to Europe with a view to establish commercial relations between France and Madagascar, B. met with a very cold reception from the French government, and returned to the service of Austria, in the hope that the emperor would assist him in his schemes—a hope not fulfilled. He next made unsuccessful overtures to the British government, but at length receiving assistance from private persons in England and America, departed again for Madagascar, where he arrived in 1785; and, involving himself in contention with the French government of the isle of France, was killed in battle, May 23, 1786. B. was a man of remarkable resources, great decision of character, courage, and sagacity. He was particularly well versed in human nature, a knowledge which proved of essential service to him during his brief but most remarkable career.—*Memoirs and Travels of Count. de Benyowsky, Written by himself and Edited by W. Nicholson* (2 vols. 4to. Lond. 1790),

BENZER'TA, LAKES OF, the ancient *Hipponitis Palus* and *Sizaræ Palus,* two lakes within the dominions of Tunis, from which town they are about 30 m. distant, in a n.w. direction. They are each about 9½ m. long, and the larger one, which is clear and salt, is about 5½ m. broad; the smaller, which is turbid and fresh, 3½. They are about 2 m. apart, but united by a channel with a general depth of 6 ft. and breadth of 75. Tunis is supplied with fish mainly from these lakes. So valuable is the fishing, that a wealthy Arab rents it from the bey of Tunis for £4000 per annum.

BENZIE, a co. in n.w. Michigan on lake Michigan; 440 sq. m.; pop. '74, 2663. The chief business is agriculture. Co. seat, Benzonia.

BENZILE, BENZOILE, or BENZOYLE, is the radical or root of the group of substances which comprehends as members the hydrate of benzoyle (oil of bitter almonds), benzoic acid, benzoin, and benzole. It is prepared by passing a stream of chlorine gas through fused benzoin, or by heating one part of benzoin with two parts of concentrated nitric acid. B. floats to the upper part of the liquid mixture as a liquid oil, which solidifies on cooling. B. is a tasteless solid, insoluble in water, but readily dissolved by ether and alcohol, and on concentration of the ethereal or alcoholic solution, the B. crystallizes in regular six-sided prisms, of a yellow color. When heated to 194° to 198° it fuses. Its composition is expressed by the chemical formula $C_{28}H_{10}O_4$, and many chemists name the substance possessing this formula *benzile,* reserving the title *benzoile* or *benzoyle* for a substance polymeric (see POLYMERISM) with benzile, which has not yet been isolated, but which may be represented by $C_{14}H_5O_2$.

BENZOIC ACID, or *the flowers of benzoin and benjamin*, occurs naturally in many balsamiferous plants, and especially in benzoin (q.v.), from which it may be readily obtained by several processes, which it is not necessary here to describe. B. A. is always in the form of snow-white, glistening, feathery crystals, with a fairy aspect of lightness. It has a very fragrant and pleasant aromatic odor, due to the presence of a trace of an essential oil, and a hot bitter taste. It is readily dissolved by alcohol and ether, but sparingly soluble in water. B. A. is one of the materials present in *tinctura camphoræ composita*, and has been administered in chronic bronchial affections; but the benefit derivable from its use in such cases is questionable. B. A. taken into the stomach, increases within 3 or 4 hours the quantity of hippuric acid in the urine. It forms a numerous class of compounds with the oxides of the metals, lime, etc., called benzoates. The chemical formula for crystallized B. A. is $HO,C_{14}H_5O_3$.

BENZOIN, BENJAMIN, or BENZOIC GUM, a fragrant resinous substance, formed by the drying of the milky juice of the benzoin or benjamin tree (*styrax*, or *lithocarpus benzoin*), a tree of the natural order *styracaceæ*, and a congener of that which produces STORAX (q.v.), a native of Siam, and of Sumatra, and other islands of the Indian archipelago. The tree grows to nearly 2 ft. in diameter; the smaller branches are covered with a whitish rusty down; the leaves are oblong, acuminate, and entire, downy and white beneath; the flowers are in compound racemes. B. comes to us in reddish-yellow transparent pieces. Different varieties, said to depend upon the age of the trees, are of very different price; the whitest, said to be the produce of the youngest trees, being the best. There is a variety known in commerce as *amygdaloidal benzoin*, which contains whitish almond-like tears diffused through its substance, and is said to be the produce of the younger trees. B. is obtained by making longitudinal or oblique incisions in the stem of the tree: the liquid which exudes soon hardens by exposure to the sun and air. B. contains about 10 to 14 per cent. of benzoic acid (q.v.); the remainder of it is resin. B. is used in perfumery, in pastilles, etc., being very fragrant and aromatic, and yielding a pleasant odor when burned. It is therefore much used as incense in the Greek and Roman Catholic churches. Its tincture is prepared by macerating B. in rectified spirit for 7 to 14 days, and subsequently straining, when the *compound tincture of benjamin, wound balsam, friar's balsam, balsam for cuts*, the *commander's balsam*, or *Jesuit's drops*, is obtained. It is frequently applied to wounds directly; or still better, when the edges of the wound are brought together, and bound with lint or plaster, the tincture of B. may be used as an exterior varnish. In the preparation of *court-plaster*, sarcenet (generally colored black) is brushed over with a solution of isinglass, then a coating of the alcoholic solution of benzoin. The tincture is likewise employed in making up a cosmetic styled *virgin's milk*, in the proportion of 2 drams of the tincture to 1 pint of rose-water; and otherwise it is used in the preparation of soaps and washes, to the latter of which it imparts a milk-white color, and a smell resembling that of vanilla. B. possesses stimulant properties, and is sometimes used in medicine, particularly in chronic pulmonary affections. It may be partaken of most pleasantly when beaten up with mucilage and sugar or yolk of egg. The name *ava dulcis* (q.v.) has sometimes been given to it, although it is not the substance to which that name seems properly to have belonged.—The milky juice of *terminalia benzoin*, a tree of the natural order *combretaceæ*, becomes, on drying, a fragrant resinous substance resembling B., which is used as incense in the churches of the Mauritius. It was at one time erroneously supposed that B. was the produce of *benzoin odoriferum*, formerly *laurus benzoin*, a deciduous shrub, of the natural order *lauraceæ*, a native of Virginia, about 10 to 12 ft. high, with large, somewhat wedge-shaped, entire leaves, which still bears in America the name of *benzoin*, or *benjamin tree*, and is also called *spice-wood* or *fever-bush*. It has a highly aromatic bark, which is stimulant and tonic, and is much used in North America in intermittent fevers. The berries are also aromatic and stimulant, and are said to have been used in the United States during the war with Britain as a substitute for pimento or allspice. An infusion of the twigs acts as a vermifuge.

BENZOIN ODORIFERUM, the benjamin tree or spice bush, properly *lindera benzoin* of the laurel order. It has an aromatic bark, used as a tonic and stimulant in intermittent fevers.

BENZOLE, BENZINE, or PHENE, is a compound of carbon and hydrogen ($C_{12}H_6$), formed during the destructive distillation of coal (see GAS; COAL), and found dissolved in the naphtha which is condensed from the vapors evolved from the gas retort. It may be prepared from coal-tar naphtha by subjecting the tar to a temperature of 32° F., when the B. solidifies, while the other naphtha constituents remain liquid. Two gallons of the naphtha yield a pint of pure rectified benzole. It can also be obtained (1) by subjecting oil-gas to a pressure of 30 atmospheres; (2) by the dry distillation of kinic acid (q.v.); and (3) by cautiously heating a mixture of one part of benzoic acid and three parts of quicklime, when the material which distills over is impure benzole. At ordinary temperatures, B. is a thin, limpid, colorless liquid, evolving a characteristic and pleasant odor. At 32° F., it crystallizes in beautiful fern-like forms, which liquefy at 40°; and at 177°, it boils, evolving a gas which is very inflammable, burning with a smoky flame. It readily dissolves in alcohol, ether, turpentine, and wood-spirit, but is insoluble in water. It is valuable to the chemist from the great power it possesses of dissolving

caoutchouc, gutta-percha, wax, camphor, and fatty substances. It is thus of service in removing grease-stains from woolen or silken articles of clothing. When heated, it also dissolves sulphur, phosphorus, and iodine. B., when acted upon by chlorine, nitric acid, etc., gives rise to a very numerous class of compounds.

BENZOYLE, HYDRIDE OF, is the volatile or essential oil belonging to the benzoic series. It is represented by the formula $C_{14}H_5O_2,H$, and has been already considered under ALMONDS, VOLATILE OIL, or ESSENTIAL OIL OF (q.v.).

BEOWULF, an Anglo-Saxon epic poem, which is one of the greatest literary and philological curiosities, and one of the most remarkable historical monuments in existence. The date of the events described is probably about the middle of the 5th c.; and as the legends refer to the Teutonic races which afterwards peopled England, it is believed that the poem, in its original shape, was brought by the Anglo-Saxons from their original seats on the continent. Only one MS. of the poem is known to exist; that, namely, in the Cottonian library, which was seriously injured by the fire of 1731. This MS. consists of two portions, written at different times and by different hands, and is manifestly a copy, executed perhaps about the beginning of the 8th c., from an older and far completer version of the poem. But, even in the form in which it came from the hands of its last recaster, B. is the oldest monument of considerable size of German national poetry, and notwithstanding the Christian allusions which fix the existing text at a period subsequent to 597 A.D., a general heathen character pervades it, which leaves little doubt as to the authentic nature of the pictures which it presents of Teutonic life in ante-Christian times. Much learned labor has been bestowed on this strange relic by Sharon Turner (*Hist. of Anglo-Saxons*, vol. iii.); Conybeare (*Illustrations of Anglo-Saxon Poetry*); Dr. G. J. Thorkelin of Copenhagen, who first published the entire work in 1815; and above all, by Mr. Kemble, whose beautiful edition was published by Pickering in 1833, and was followed in 1837 by a translation, with glossary, preface, and philological notes.

At first Mr. Kemble was disposed to regard B. as an historical epic, but his view of it latterly came to be, that though to some extent historical, it must be regarded, in so far as the legends are concerned, as mainly mythological; and this remark he conceived to apply to the hero not less than to the incidents related. But Beowulf, the god, if such he was, occupies only a small space in the poem, and seems to be introduced chiefly for the purpose of connecting Hrothgar, king of Denmark, whom Beowulf, the hero, comes to deliver from the attacks of the monster Grendel, with Scef or Sceaf, one of the ancestors of Woden, and the common father of the whole mythical gods and heroes of the north. Sceaf is traditionally reported to have been set afloat as a child on the waters, in a small boat or ark, having a *sheaf* (Ang.-Sax. sceaf) of corn under his head; whence his name. The child was carried to the shores of Slesvig, and being regarded as a prodigy, was educated and brought up as king. Between Sceaf and Beowulf, Scyld intervened, according to the opening canto of the poem; but when compared with kindred traditions, the whole genealogy becomes involved in extreme obscurity, and Scyld seems sometimes to be identified with Sceaf, and sometimes with Woden. But the view of the connection between Beowulf and Sceaf is strengthened by the following considerations. The old Saxons, and most likely the other conterminal tribes, called their harvest month (probably part of Aug. and Sept.) by the name Beo or Beowod, in all probability their god of agriculture or fertility. Whether, or to what extent, this divinity is identical with the mythical hero of the poem, Mr. Kemble does not venture to determine, though he indicates a strong leaning to the affirmative.

But in so far as the main points of historical interest are concerned—viz., the [illegible] of the legends, and the race and regions to which they belong—the results of the historical and of the mythological view seem to be pretty nearly the same. The poem falls entirely out of the circle of the northern sagas, and probably belongs to Slesvig. All the proper names are Anglo-Saxon in form, but not the slightest mention is made of Britain, the Ongle mentioned being manifestly Angeln (see ANGLES), and not Anglia. From this and many other considerations, the learned editor infers that B. records the mythical beliefs of our forefathers; and in so far as it is historical commemorates their exploits at a period not far removed in point of time from the coming of Hengest and Horsa, and that in all probability the poem was brought over by some of the Anglo-Saxons who accompanied Cerdic and Cyneric, 495.

The poem opens with an incident which reminds us of one of the most beautiful of Mr. Tennyson's earlier poems, the *Mort d'Arthur*, and seems to show a similarity between British and Germanic traditions. We give it in the simple words of Mr. Kemble's prose translation.

"At *his* appointed time then Scyld departed, very decrepit, to go into the peace of the Lord; they then, his dear comrades, bore him out to the shore of the sea, as he himself requested, the while that *he*, the friend of the Scyldings, the beloved chieftain, had power with *his* words; long he owned it! There upon the beach stood the ring-prowed *ship*, the vehicle of the noble, shining like ice, and ready to set out. They then laid down the dear prince, the distributer of rings, in the bosom of the ship, the mighty one beside the mast; there was much of treasures, of ornaments, brought from afar. Never heard I of a comelier ship having been adorned with battle-weapons and with war-weeds, with bills and mailed coats. Upon his bosom lay a multitude of treasures which were

to depart afar with him, into the possession of the flood. They furnished him not less with offerings, with mighty wealth, than those had done who in the beginning sent him forth in his wretchedness, alone over the waves. Moreover they set up for him a golden ensign, high overhead; they let the deep sea bear *him;* they gave *him* to the ocean. Sad was their spirit, mournful *their* mood. Men know not in sooth to say (men wise of counsel, *or any* men under the heavens) who received the freight."

The following is a brief outline of the story: B. is introduced to us, preparing for a piratical adventure. After a vivid description of the embarkation of the hero and his "friendly Scyldingi," the scene changes, and the palace of Hrothgar rises before us. Here the Danish king has assembled his warriors, and holds a feast, unconscious of the deadly peril in which he is placed. The "scop" ("shaper," from *scapan*, "to shape" or "create") sings a poem on the origin of things, and how evil came into the world. This is deftly used to bring upon the stage the "grim stranger Grendel, a mighty haunter of the marshes, one that held the moors, fen, and fastness, the dwellings of the monster-race." Malignant and cruel, he hears with envious hate the sounds of joy echoing from the hall, and stealing into the palace after dark, when the revel is over, he seizes and destroys thirty of the sleeping thegns. In the morning, when the havoc wrought by Grendel becomes known, there is a fierce outcry, and Hrothgar is loudly blamed. Yet twelve winters pass by before the outrage is avenged. The king is continually "seethed in the sorrow of the time;" but help is at hand. B. has heard of the crimes of the monster, and comes with his Geats (Jutes) to inflict punishment. The voyage over the waves, and the landing of the brave adventurers on the shores of Hrothgar's dominions, is finely told. After some parley with the coast-guards, an interview takes place between the monarch and the hero, who almost pleads to be allowed to deliver the land from the ravages of Grendel. Most tender and pathetic is the passage in which he asks—if fortune should be adverse to him ("if Hilda"—i.e. "the goddess of slaughter"—"should take him away"), that they would not mourn over the "solitary rover," but plant a "simple flower" on his cairn, and send back his "garments of battle" to his lord and kinsman, Higelac. The inevitable feast follows, in the course of which the "scop" sings of the peace that is to be, and B. enlarges upon his past exploits. Then we have an exquisite picture of the Danish queen: "There was laughter of heroes, the noise was modulated, words were winsome; Wealtheow, Hrothgar's queen, went forth; mindful of their races, she, hung round with gold, greeted the men in the hall; and the free-born lady gave the cup first to the prince of the east Danes; she bade him be blithe at the service of beer, dear to his people. He, the king, proud of victory, joyfully received the feast and hall-cup. The lady of the Helmings then went round about every part of young and old; she gave treasure-vessels, until the opportunity occurred, that she, a queen hung round with rings, venerable of mood, bore forth the mead-cup to Beowulf. Wise of words, she greeted the Geat, she thanked God because her will was accomplished, that she believed in any earl, *as* a consolation against the crimes." That night, when the shadows of darkness have fallen, Grendel comes swiftly to the palace from the misty moors, and assails Beowulf. A fierce struggle ensues, but the monster is baffled, and obliged to flee. Next day a second feast is held in honor of the hero's success, magnificent gifts are showered upon him by the grateful Hrothgar, the services of the "scop" are again called into request, music and sports follow, and the queen once more moves through the crowd of warriors with courtesy and grace. The night, however, is not to pass without its tragedy. The mother of the monster secretly enters, and destroys one of the king's dearest thegns. B., in a magnanimous speech, undertakes to avenge him. Having sought the wild haunts of the "hateful one," he first slays the mother after a furious combat, in which he would have been vanquished but for the apparition of a magic sword "over the waves," which came into his grasp. Grendel is then destroyed, and his head carried off as a present to Hrothgar. B. then returns home, and after a variety of other but less interesting adventures, succeeds to the throne on the death of his kinsman Higelac. More recent editions than those above noted are that by Heyne (1863, 3d ed. 1873); and the admirable English one of Thomas Arnold, published with translation, notes, and appendix in 1876. Wackerbarth (1849) and Thorpe (1855) have given English metrical translations; the best German versions are those of Simrock (1859), Heyne (1863), and Von Wolzogen (1873).

BEPUR, or BEYPORE, a seaport of western India, 6 m. s. of Calicut. Its situation is very beautiful. It has a considerable trade in timber, particularly teak, which is floated down the river for exportation. Iron ore is found in the neighborhood, and iron-works have recently been established here. B. is the terminus of a railway across the peninsula of India from Madras by way of Coimbatore, and will probably soon become a place of great importance. Pop. in 1871, 5858.

BEQUEATH, to leave personal property by will or testament to another. In the case of *real* estate, the proper term to employ is *devise*. But although it is usual and safe so to use these words, neither of them is essential to the validity of an English will, but other words, showing clearly the intention of the testator, will suffice. In the Scotch law, the term B. can only apply to *personal* estate. Real estate, indeed, according to the existing regulations of that system, cannot be left or conveyed by will or testament; a testamentary disposition or settlement, expressed in certain technical terms of present

conveyance, being necessary for the purpose. See WILL; LEGACY; DISPOSITION (*mortis causâ*); SETTLEMENT; REAL; PERSONALITY.

BEQUEST, a legacy of personal property left by will. See BEQUEATH and its references.

BÉRANGER, JEAN-PIERRE DE, a celebrated French poet, was b. in Paris, 19th Aug., 1780, in the house of his grandfather, a tailor in the Rue Montorgueil, to whose care he was left entirely by his father, a scheming and not over-scrupulous financier. After living some time with an aunt at Péronne, to whom he appears to have been indebted for those republican principles which afterwards made him so obnoxious to successive French governments, B., at the age of 14, was apprenticed to a printer in that place, where he remained three years, devoting all his leisure hours to the acquirement of knowledge. He now returned to Paris, where his father, a zealous royalist, was engaged in some questionable schemes of money-getting, which were mixed up with conspiracy. B. assisted him in his money affairs, so far as he honorably could, and kept his political secrets; but he did not disguise his contempt for the royalist cause, nor fail to express his opposite sympathies. The business, however, was not one to the taste of B., who was throughout the whole of his life a man of the most sensitive honor, and he soon left it. He had ere this begun to write, but his poems were not successful; and reduced almost to destitution, he, in 1804, inclosed some of his verses to M. Lucien Bonaparte, with a letter explaining his circumstances, and with a request for assistance—the one solitary instance of solicitation during a long life of independence, marked by the refusal of numerous offers of lucrative patronage. The appeal was not made to a deaf ear. M. Bonaparte obtained employment for the poet, first as editor of the *Annales du Musée*, and afterwards as a subordinate secretary in the university; a post which he held for 12 years, when the government, provoked at his satire, and alarmed at his popularity, dismissed him. During the "hundred days," Napoleon offered B. the remunerative post of censor—a singular office for such a man. He refused it. But though he scorned to accept favor from, or to flatter Napoleon, at a time when it was alike fashionable and profitable to do so, he was of much too noble a nature to join in the sneers and reproaches which greeted the hero on his fall. Above the fear of power, he was incapable of taking advantage of misfortune. In 1815, B. published his first collection of songs, which soon attained a very wide popularity. In 1821, he published another collection, which was followed shortly after by some fugitive pieces, which subjected him to a government prosecution, a sentence of three months' imprisonment, and a fine of 500 francs. In 1825, a third collection, and in 1828, a fourth appeared, still more withering in its sarcasm on those in power; and the penalty of B.'s outspokenness was a fine of 10,000 fr., and nine months' confinement in La Force. The fine was soon paid by the poet's friends, and his prison became the resort of the most eminent men in the kingdom, and a very armory in which he forged those keen-piercing bolts which galled so terribly, and contributed so much to the overthrow of the Bourbons. But B. refused to profit by the new state of things he had been instrumental in bringing about. Rejecting the emoluments and honor which his friends, now in power, were anxious to bestow, he retired to live in privacy at Passy. In 1833, he published a fifth collection of songs, when he took a formal leave of the public; and from that time until the day of his death, 24 years after, he remained silent. In 1848, B. was elected a member of the assemblée constituante by more than 200,000 votes; but after taking his seat, to show his appreciation of the honor conferred on him, he almost immediately resigned. He consistently rejected all the offered favors of the late emperor, as well as a graceful overture on the part of the empress, which he owned it cost him much to refuse. B. died at Paris, July 17, 1857. The cost of his funeral was defrayed by the French government, and his remains were attended to the grave by the most distinguished men in all departments of literature. B. was as emphatically the poet of the French people as Burns was the bard of the Scottish peasantry. The same stanch and fearless independence, genuine manliness, sound common-sense, and contempt for everything mean and hypocritical, characterized both men; and as poets, they differ in excellence only as the sentiments of the French and Scottish people differ in their capacity to be turned into song. "Neither friend nor enemy has as yet disclosed to us any speck on the heart, the honor, the genius, or the good sense of Béranger." Since his death, his *Last Songs*, written between 1834 and 1851, have been published, and also *My Biography* (Paris, M. Perrotin; London, Jeffs). See *My Biography; Mémoirs of Béranger*, by M. Lapointe; and *Béranger et son Temps*, by Jules Janin (1866).

BERAR', a valley situated locally in the Nizam's territories, but annexed politically to British India, for the maintenance of what is called the Nizam's contingent. It is bounded on the n. by a detached portion of Scindia's dominions and the Nerbudda provinces; on the e. by Nagpoor; on the w., by Candeish; and on the s., by two of the Nizam's remaining districts—Maiker Bassim and Mahur. It lies between 20° 15′ and 21° 40′ n. lat., and between 76° and 78° 2′ e. long, having an area of 16,960 sq. miles. Pop. '68, 2,231,565. It is traversed in its length by the Poornah—itself a tributary of the Taptee—which, with its numerous affluents, affords an ample supply of water to the valley, and, on other grounds, is peculiarly suitable to the cultivation of cotton. The transfer in 1853 from the Nizam to the British has proved favorable to this production; about 25

per cent of the area is devoted to cotton. In the e. part there is a coal-field of 40 sq.m., and at Akolah, in Purana, there are salt wells fed by a subterranean lake. Though Ellichpore is the chief town, yet it is inferior to Oomrawutti.

BÉRARD, FRÉDÉRIC, 1789–1828; a French physician and writer on physiology, educated at Montpellier, and employed in Paris on the *Dictionary of Medical Sciences*. He held a chair of medicine in Paris, and was a professor of hygiene in Montpellier, where he died from excessive work at the age of 39. His most important work is *Des Rapports du Physique et du Moral*, in which he holds that the soul and the principle of life are in constant reciprocal action, and the first owes to the second not the formation of its faculties, but the conditions under which they are evolved.

BERAT', a t. of Albania, European Turkey, in the vilayet of Janina, situated on the banks of the Usumi, about 30 m. n.e. of the seaport of Avlona. Pop. 8000 to 10,000, two thirds of whom are Greeks; the remainder Turks. The valley in which B. stands is very fertile, producing large quantities of grain, oil, and wine. B. has a citadel, and traces of ancient Greek buildings, and gives title to a Greek archbishop.

BERBER, EL MEKHEIR, or EL MESHERIF, a t. on the e. bank of the Nile, below the confluence of the Atbara, about 18° n., 34° e. It is important only as one of the main stations on the direct route from Khartoum to Cairo, and as the starting-place for caravans going to Suakin, on the eastern coast. Pop., estimated, 8000.

BER'BERA, a seaport station of Somali, eastern Africa, with a good harbor, on a bay of the gulf of Aden. Lat. 10° 26′ n., long. 45° 8′ e. It is celebrated as the scene of a large annual fair, which brings nearly 20,000 people together from all quarters in the east. Coffee, grains, ghee, gold-dust, ivory, gums, cattle, ostrich-feathers, slaves, etc., are brought down to this place from the interior on strings of camels, sometimes numbering as many as 2000, and exchanged for cotton, rice, iron, Indian piece-goods, etc. As soon as the fair—which usually extends from Nov. to April—is over, the huts are carefully taken down, and packed up, and nothing remains to mark the site of the town but the bones of animals slaughtered for food during the continuance of the fair.

BERBERID'EÆ, or BERBERIDA'CEÆ, a natural order of exogenous plants, of which the different species of barberry (q.v.) afford the best known examples. Many of the plants of this order are spiny shrubs; some are perennial herbaceous plants. Their leaves are alternate, their flowers sometimes solitary, sometimes in racemes or panicles. The calyx consists of 3, 4, or 6 deciduous sepals; the corolla, which arises from beneath the germen, consists of petals equal in number to the sepals, and opposite to them, or twice as many; the stamens are equal in number to the petals, and opposite to them; the anthers are 2-celled, each cell opening curiously by a valve which curves back from bottom to top; the carpel is solitary and 1-celled; the fruit is either a berry or a capsule. This order, which is nearly allied to *vitaceæ* (q.v.), (vines, etc.), contains more than 100 known species, chiefly belonging to the temperate parts of the northern hemisphere, and of South America.

BERBERINA, or BERBERINE, an alkaloid in the barberry, columbo, yellow root, and other plants, appearing in minute yellow crystals of bitter taste. Its formula is C_{40},H_{17},NO_8. There is an impure muriate called hydrastin, sometimes used as a medicine.

BERBERS, the general name usually given to the tribes inhabiting the mountainous regions of Barbary and the northern portions of the great desert. It is derived, according to Barth, either from the name of their supposed ancestor, *Ber*, which we recognize in the Lat. *A-fer*, an African (see letter B); or from the Greek and Roman term *Barbari*. The name by which they call themselves, and which was known to the Greeks and Romans, is Amázigh, or Mazigh, Mazys, Amoshagh, Imoshagh, etc., according to locality, and whether singular or plural. These tribes have a common origin, and are the descendants of the aboriginal inhabitants of northern Africa. They appear to have been originally a branch of the Semitic stock; and although they have been conquered in succession by the Phœnicians, Romans, Vandals, and Arabs, and have become, in consequence, to some extent, a mixed race, they still retain, in great part, their distinctive peculiarities. Till the 11th c., the B. seem to have formed the larger portion of the population inhabiting the southern coast of the Mediterranean, from Egypt to the Atlantic ocean; but, on the great Arab immigrations which then took place, they were driven to the Atlas mountains, and to the desert regions where they now live. In Tripoli, the allegiance they pay to the Turks is little more than nominal; in Algeria, where they usually are termed Kabyles, they are yet unconquered by the French; and in Morocco, where they are called "Shellooh," they are only in form subject to the emperor. The B. occupying the desert, who are called Tuaric, or Tawarek, by the Arabs, have become much mixed with the negro race. The number of the B. is estimated at between three and four millions. They are of middle stature, sparely but strongly built. The complexion varies from a red to a yellow brown, and the shape of the head and the features has more of the European than the oriental type. The hair is, in general, dark, and the beard small. The eyes are dark and piercing. Their manners are austere, and in disposition they are cruel, suspicious, and implacable. They are usually at war, either with their neighbors or among themselves; are impatient of

restraint; and possessed of a rude, wild spirit of independence, which makes it impossible for them to unite for any common purpose, or to make the advances in civilization which one might otherwise expect from their high physical organization. They live in clay-huts and tents; but, in their larger villages, they have stone-houses. They have herds of sheep and cattle, and practice agriculture, and are especially fond of the cultivation of fruit-trees. They possess water-mills and oil-presses. The mines of iron and lead in the Atlas are wrought by them, and they manufacture rude agricultural implements, as well as swords, guns, and gunpowder. They formerly professed the Christian religion; but since the Arabs drove them from the fertile plains between the mountains and the sea, they appear to have retrograded in every way, and they are now among the most bigoted adherents of the religion of Mohammed; although their former creed has left a few traces, as in the names *Mesi* for God, and *angelus* for angel, and many curious customs still observed among them. See Barth's *Africa*, vol. i.

BERBICE, the eastern division of British Guiana, is bounded w. by Demerara; n. by the Atlantic; e. by Dutch Guiana or Surinam; and s. by the basin of the Amazon, or rather, perhaps, the upper waters of the Surinam and Corentyn. In 1796, Berbice, Demerara, and Essequibo were surrendered to the British under maj gen. Whyte, but were soon after restored to the Dutch at the peace of Amiens, and recaptured in 1803. B. stretches in long. between 55° 40′ and 57° 20′ w., and in lat. southward from 6° 30′ north. It is subdivided into six parishes, four of which belong ecclesiastically to the Scotch national church, and two to the Episcopalian. Pop. about 32,000, of whom nearly 4000 are white and of mixed race. The principal products are sugar, coffee, cocoa, and tropical fruits. Cotton has all but ceased to be grown. The forests abound with splendid timber trees, including the mora, bullet-tree, and cedar. The Berbice river, though not the largest in British Guiana, is navigable to the greatest distance from the sea. The Essequibo discharges a greater volume of water, but is interrupted by rapids within 50 m. of the coast, while the Berbice admits a draught of 12 ft. for 100 m., and one of 7 ft. for 60 more, the influence of the tide reaching nearly the whole way. Even as far as lat. 3° 55′ n., 175 m. in a straight line from its outlet, it has been found to have a width of 100 ft., with a depth of from 8 to 10. An important affluent is the Canje, on the banks of which a number of the most important plantations are situated. New Amsterdam, on the right bank of the Berbice river (pop. 7000), is the chief town and port of the district.

BERCETO, a t. of Italy, in the province and 25 m. s.w. from the city of Parma, beautifully situated amongst the Apennines. It is a clean, well-built town. The church is an old Gothic building. The mountains rise rapidly to the w. of B., and some of the scenery which they present is very wild and desolate.

BERCHTA (in old German, Peracta, and the original form of the name Bertha, being from the same root as the English word *bright*, and meaning "shining," "white") is, in German mythology, the name given in the s. of Germany and in Switzerland to a spiritual being, who was apparently the same as the Hulda (gracious, benign) of northern Germany. This being represented originally one of the kindly and benign aspects of the unseen powers; and so the traditions of Hulda (q.v.) in the north continued to represent her. But the B. of the south, in the course of time, became rather an object of terror, and a bugbear to frighten children; the difference probably arising from the circumstance, that the influence of Christianity in converting the pagan deities into demons was sooner felt in the south than in the north. Lady B. has the oversight of spinners. The last day of the year is sacred to her, and if she find any flax left on the distaff that day, she spoils it. Her festival is kept with a prescribed kind of meager fare—oat-meal-gruel, or pottage, and fish. If she catches any persons eating other food on that day, she cuts them up, fills their paunch with chopped straw and other such agreeable stuffing, and then sews up the wound with a plowshare for a needle, and an iron chain for a thread. In some places, she is the queen of the crickets. She is represented as having a long iron nose and an immensely large foot. That she was once an object of worship, is testified by the numerous springs, etc., that bear her name in Salzburg and elsewhere. It is likely that many of the sagas of B. were transferred to the famous Berthas (q.v.) of history and fable. The numerous stories of the "White Lady" who appears in noble houses at night, rocks and nurses the children while the nurses are asleep, and acts as the guardian angel of the race, have doubtless their root in the ancient heathen goddess Berchta.

BERCHTESGADEN, a principality of Bavaria, adjoining the Austrian duchy of Salzburg, and forming the extreme s.e. corner of the German empire; 155 sq.m.: pop. 9500. It is a rough mountain region, unfit for agriculture or even pasturage; but the scenery is magnificent. The Konig's lake, nearly surrounded by mountains, has on its shore at St. Bartholoma, a chapel much frequented by pilgrims. There is also a chapel of ice. The main industry of the people is the manufacture of toys, known in commerce as Berchtesgaden wares.

BERCHTESGADEN, a village of Bavaria, charmingly situated on a mountain slope, about 15 m. s. of Salzburg. Pop. '71, 1763. It has a royal hunting-lodge, but the place is most remarkable for its government salt-mines, from which 150,000 cwt. of rock-salt

is annually obtained. During the residence of the court, the mine is sometimes illuminated, and its chambers are then seen to great advantage.

BERCY, a t. of France, in the department of the Seine, situated on the right bank of the river of the same name. B. forms a suburb of Paris, and its population is reckoned as a portion of that of the capital. It has a large business in wines and other liquors.

BERDIANSK, a well-built seaport town of southern Russia, government of Taurida, on the northern coast of the sea of Azov. B. has the finest roads in the sea of Azov, and is a place of commercial activity, being the entrepot for the products of surrounding governments. It trades in fish, wood, hides, tallow, grain, coal, and salt; there are extensive coal-mines and salt-lakes in its vicinity. Pop. '67, 12,465. In 1855, during the Crimean campaign, capt. Lyons destroyed government property to a large amount, but the town was spared.

BERDITCHEV', a t. of Russia, in the government of Kiev, famous for its five annual fairs. At these, cattle, corn, wine, honey, leather, etc., are disposed of. The average annual value of the sales is £600,000. Pop. '67, 52,786, chiefly Jews.

BEREA COLLEGE, in Madison co., Ky., 40 m. s. of Lexington, was originated by John G. Fee, a minister, son of a slaveholder, but a zealous opponent of the system. For this opposition his father and his church disowned him. Always under suspicion, the college was suppressed, after the John Brown affair, and its officers were driven from the state. After peace it was revived, and has prospered greatly, having an annual average of nearly 300 students, of whom about 60 per cent are males and about 60 per cent colored persons. There has never been any trouble about color or sex in the institution. The curriculum is about the same as in other colleges. The college was opened in 1858. At last report there were the president, Rev. E. H. Fairchild, and 12 professors and instructors, and 31 students of the college grade.

BEREANS, an almost extinct sect of Christians, who originated in Scotland in the 18th century. Their name is derived from the circumstance that the inhabitants of Berea "received the word with all readiness of mind, and searched the Scriptures daily."—Acts xvii. 11. The founder of the B. was the Rev. John Barclay, a native of Perthshire, b. 1734, d. 1798. From him they also received the name of Barclayans. They believe that the knowledge of God's existence and character is derived from the Bible alone, and not from reason or nature; that the Psalms of David do not relate to David at all, but exclusively to Christ; that assurance is of the essence of faith; and that unbelief is the unpardonable sin. In the ordinary points of doctrine they are Calvinistic.

BEREGH, a co. in Hungary, s.w. of Galicia; 1429 sq.m.; pop. '70, 159,223, about half Ruthenians, and the remainder Magyars, with the exception of 8000 Jews, Germans, etc. It is mountainous and barren in the n., but fertile in the s., producing excellent wine. Capital, Berigszasz; pop. 6272.

BERENGAR I., King of Italy, was the son of Eberhard, duke of Friuli, and of Gisela, the daughter of the emperor Louis the pious. He and Guido, duke of Spoleto, were the two most powerful and ambitious nobles in Italy at the close of the 9th century. After the deposition of Charles the fat in 887, B., Guido, and Adalbert, count of Tuscany, became candidates for the Carlovingian throne. B. was crowned king of Italy at Pavia in 888, while Guido attempted to secure the realm of France. The former soon irritated the nobles against him by condescending to hold his territory in fief from Arnulf, king of Germany, against whom he found it vain to maintain his independence; and when Guido returned from his unsuccessful expedition to France, he was persuaded to put himself in opposition to B., and was chosen king of Italy. With the help of Arnulf, however, B. ultimately prevailed. After the death of Guido in 894, his son Lambert compelled B to share with him the sovereignty of n. Italy; but, on the assassination of Lambert in 898, B. contrived to obtain possession of the whole of Lombardy. His influence quickly sank. He could check neither the plundering incursions of the Hungarians across the Alps in the n., nor those of the Arabs, who laid waste the shores of the south. The nobles now called in Louis, king of lower Burgundy, who was crowned at Rome in 901; but he proved no better, and was finally overpowered by Berengar. In 915, B. was crowned emperor by pope John X.; but the nobles, who appear to have kept themselves during his reign in a state of chronic disaffection, again revolted, and, in 919, placed themselves under the banner of Rodolf of Burgundy, who completely overthrew B. on the 29th July, 923. The latter, in his extremity, called in the Hungarians to his aid, which unpatriotic act alienated the minds of all Italians from him, and cost him his life, for he was assassinated in the following year, 924.

BERENGAR II., the son of Adalbert, count of Ivrea, and grandson of Berengar I., succeeded to his father's possessions in 925, and married Willa, niece of Hugo, king of Italy, in 934. Incited by his ambitious and unscrupulous wife, he conspired against Hugo, and in consequence was compelled to flee to Germany, where he was received in a friendly manner by the emperor Otto I. In 945, he recrossed the Alps at the head of an army. The nobles and the townspeople both welcomed him; but, instead of assuming the crown himself, he handed it over to the weak Lothaire, the son of Hugo. On the

death of Lothaire, who was probably poisoned by Willa, B. allowed himself to be crowned along with his son Adalbert, in 950. To establish himself firmly in his new position, he wanted Adelheid, the youthful widow of Lothaire, to marry his son. She refused, and was subjected to a most cruel imprisonment, but ultimately found a helper and husband in the emperor Otto himself, who, at the imperial diet of Augsburg in 952, compelled B. to acknowledge Italy to be a fief of the German empire. B. soon after engaged in war with the emperor, who sent his son Ludolf against him. Ludolf was successful, but died in 957, of poison administered, as was believed, by Willa. B. again mounted the throne, but behaved with such intolerable tyranny that his subjects and pope John XII. called in the aid of the emperor, who marched into Italy in 961, and took possession of the country. B. took refuge in a mountain-fortress, where he held out till 964, when hunger compelled him to capitulate. He was sent as a prisoner to Bamberg, in Bavaria, where he died in 966. His wife, Willa, retired into a convent, and his three sons died in exile.

BERENGARIUS OF TOURS, a distinguished scholastic theologian, was b. at Tours, in France, 998 A.D. His master, Fulbert de Chartres, is reported to have prophesied on his death-bed that Berengarius would prove a dangerous man. In 1030, he was appointed preceptor of the school of St. Martin, in Tours, and in 1040, made archdeacon of Angers. Here he continued to deliver his metaphysico-theological prelections, and drew upon himself the charge of heresy, in reference to the doctrine of transubstantiation. He held the doctrine of Scotus Erigena, that the bread and wine in the sacrament of the eucharist remained bread and wine, and that the faith of the believer who recognized their symbolic meaning only transformed them subjectively into the body and blood of Christ. This interpretation was condemned by pope Leo IX., 1049–1050, and also by king Henry I. of France. In 1054, he retracted his opinion before the council of Tours, but what Berengarius meant by "retractation" it is not easy to see, for he immediately returned to his conviction, and recommenced the advocacy of it. For this he was cited to appear at Rome, where he repeatedly abjured his "error," but never seems to have really abandoned it. Hildebrand, who was then pope, treated him with great moderation; and at last, when he discovered how hopeless it was to bind down Berengarius by abjurations or declarations, he conceived it best to let him alone. Harassed and weakened by the attacks of the orthodox party, headed by Lanfranc of Canterbury, he finally retired to the isle of St. Cosmas, near Tours, in 1080, where he spent the last years of his life in devotional exercises. He died in 1088. The greater number of his works are lost; such as are extant have been collected and published by the Vischers (Berlin, 1834).

BERENICÉ, the name of several celebrated women of ancient times.—1. B., daughter of Lagus and Antigone, and the second wife of the Egytian king, Ptolemy I. (Soter), (323–284 B.C.). She is described by Plutarch as the first in virtue and wisdom of the wives of Ptolemy. Theocritus celebrates her beauty, virtue, and deification in his *Idyls* 15 and 17.—2. B., daughter of Ptolemy II. (Philadelphus) and Arsinoë, was married to Antiochus II. of Syria, after he had divorced his wife Laodice, whom, however, he again took back, putting B. away. Laodice having no faith in her husband, poisoned him, and caused B. and her son to be murdered.—3. B., daughter of Magas, king of Cyrene, granddaughter of B. No. 1, was to have been married to Demetrius the fair, but he having slighted her for her mother, she caused him to be murdered, and then went to Egypt and married Ptolemy III. (Euergetes), in accordance with the terms of a treaty between her father and Ptolemy II. During the king's wars in Asia, the queen B. made a vow to offer her beautiful hair to the gods when her husband returned safely—a vow which she fulfilled. The hair was suspended in the temple of Venus, whence, it is said, it was taken away to form a constellation, *Coma Berenicæ*. B. was put to death by her son, Ptolemy IV. (Philopator), when he succeeded to the throne.—4. B., also called Cleopatra, daughter of Ptolemy IX. (Lathyrus), was, on her succession to the throne, married to Alexander II., by whom she was murdered 19 days after marriage.—5. B., daughter of Ptolemy XI. (Auletes), eldest sister of the renowned Cleopatra, was raised to the throne after her father's deposition, 58 B.C., but was put to death when her father was restored, 55 B.C. She was first married to Seleucus, whom she caused to be put to death, and afterwards to Archelaus, who was put to death with her.—There were, besides, two Jewish Berenices—the one, daughter of Salome, sister of Herod the great and Costobarus, and mother of Agrippa I.; the other, and more famous, was daughter of this monarch. She was three times married: first, at a very early age, to Marcus, son of Alexander the Alabarch; afterwards to her uncle, Herod, king of Chalcis, who dying, left her for the second time a widow, at the age of 20; and again to Polemon, king of Cilicia, whom she soon deserted to return to her brother, king Agrippa II., the same before whom Paul defended himself at Cesarea. After the capture of Jerusalem, she went to Rome, and Titus, who was much in love with her, would have married her but for the opposition of the people. The intimacy of B. and Titus forms the subject of a tragedy by Racine.

BERENICÉ (modern name, Sakáyt-el-Kublee, "Southern Sakáyt"), a t. of Egypt, on a bay in the Red sea, 20 m. s.w. of Ras Bernass. It was founded by Ptolemy Philadelphus, and was in ancient times the emporium of the trade with India, but it is

now ruined, and interesting only for its antiquities, which include hieroglyphics, sculptures, and a temple dedicated to Serapis. There are emerald mines in its vicinity that have been worked since the time of the ancient Egyptians.

BERESFORD, JAMES, 1764–1840; an English author, educated at Oxford, and a rector in Leicestershire. His *Miseries of Human Life*, a satire in prose, is well known.

BERESFORD, WILLIAM CARR, Viscount, a distinguished military commander, natural son of the first marquis of Waterford, was born 2d Oct., 1768, and entered the army in 1785. After serving in various parts of the world, he bore a conspicuous part in the reconquest of the cape of Good Hope in 1806, and subsequently, with the rank of brig.gen., was with the British force that took possession of Buenos Ayres. In Aug., 1808, he joined the British army in Portugal, and proceeded into Spain with sir John Moore's force; was present at the battle of Corunna; and, after covering the embarkation of the troops, returned with them to England. In Feb., 1809, maj.gen. B. was ordered a second time to Portugal, to take the command of the Portuguese army, with the local rank of lieut.gen.; and he succeeded in improving its discipline so greatly, as soon to render it highly efficient for active service. Appointed marshal of Portugal in Mar., at the head of 12,000 men, he attacked the French in the north of that kingdom, crossed the river Douro, drove Loison's division back to Amarante, and uniting with the force under sir Arthur Wellesley, pursued it in its retreat till it was utterly disorganized. For his services at the battle of Busaco, 27th Aug., 1810, B. was nominated a knight of the bath. He commanded at the bloody battle of Albuera, May 16, 1811, and for the victory there gained over Soult, he received the thanks of parliament. He was present at Badajoz; at Salamanca, where he was severely wounded; at the various battles on the Pyrenees; at Nivelle, where he led the right of the center; at Nive; and at Orthez. He was in command of the British troops which took possession of Bordeaux, and subsequently distinguished himself at the battle of Toulouse. In May, 1814, he was created baron, and in 1823 viscount Beresford. By the Portuguese government, he was sent, in 1814, to Rio Janeiro, to suppress a formidable revolt there. In the Wellington administration, Jan., 1828, to Nov., 1830, he was master-gen. of the ordnance. He bore the title of marquis of Campo, mayor and duke of Elvas in Spain, conde de Francoso in Portugal, and was knight of several foreign orders. He died, without issue, 8th Jan., 1854, when the title became extinct.

BERESI'NA, or BEREZI'NA, a river of Russia, having its rise in the n. of the government of Minsk. It flows in a southward direction for about 240 m. to the Dnieper, which it joins above Redchitzka. It is connected with the Düna, or Dwina, by a canal, a communication between the Black and Baltic seas being thus established. The B. is memorable on account of the disastrous passage of the French army, Nov., 1812, during the retreat from Moscow. Two bridges over the B.—one for troops, the other for baggage and artillery—were hastily constructed. Many of the *pontoniers* died from the hardships endured in making these bridges. On the 27th, the passage of the French commenced, and was continued during the whole of the day. Victor's rear-guard of 7000 men, under Partonneaux, were, however, intercepted by the Russians, and had to capitulate. On the 28th, a vigorous attack was made by the Russians on the French on both sides of the river, but too late to prevent the latter securing the road to Zembin. The Russians, however, established a battery of 12 pieces to command the bridge; and the panic and confusion of their enemies now became dreadful. The artillery bridge broke, and all rushing to the other, it was soon choked; multitudes were forced into the stream, while the Russian cannon played on the struggling mass. On the 29th, a considerable number of sick and wounded soldiers, women, children, and sutlers, still remained behind, despite the warnings of marshal Victor and gen. Eblé, until preparations were made for burning the bridges. Then a fearful rush took place; and as the fire seized the timbers, men, women, and children threw themselves in desperation into the flames or the river. 12,000 dead bodies found on the shores of the river, when the ice thawed, attested the magnitude of the French distaster. The Russians took 16,000 prisoners and 25 pieces of cannon.

BERET TYO-UJFALU', a market-town of Hungary, co. Bihar, with a pop. '69, of 5760.

BEREZ'NA, a t. of Russia, in the government of Tchernigov, on the Desna. Pop. '67, 9678.

BEREZOV', or BERESOFF' ("the town of birch-trees"), a t. of Siberia in the government of Tobolsk, on the left bank of the Sosva, a branch of the Obi, in lat. 63° 30' north. It is a small place, but important as the sole fur and skin trading station in a vast extent of country. Its annual fair is largely attended. It is the favorite residence of the Ostiaks and Voguls. Prince Menschikoff, the favorite of Peter the Great, who was banished to B., died and was buried here in 1731. His grave was opened 90 years afterwards, when his body, clothed in the uniform of the time, was found as free from decay as on the day it was buried, the frost, which at B. penetrates the soil to the depth of several feet, having preserved it. Pop. '67, 1561.

BERG, BURG, BURGH, roots entering into the composition of many names of places. *Berg* (Ger.), *Beorg* (Ang.-Sax.), means "hill," "mountain;" and *burg*, or *burgh*, means

"fort," "castle," "citadel," probably from being situated on a hill or eminence. See BOROUGH, BURGH.

BERG, formerly a duchy of Germany, now incorporated with the Prussian dominions, and divided into the circles of Düsseldorf, Solingen, Elberfeld, Lennep, and Duisburg. After various vicissitudes, B. had merged in the electorate of Bavaria. In 1806, Bavaria ceded it to France; and Napoleon the same year adding to it large adjoining territories, made its area about 6700 sq.m., and erected it into a grand duchy, constituting his brother-in-law, Murat, sovereign. Two years afterwards, Murat, being transferred to the throne of Naples, Napoleon's nephew, then crown prince of Holland, was made grand duke. The peace of 1815 gave B. to Prussia.

BER'GA, a t. of Catalonia, Spain, situated near the river Lobregat, 52 m. n.n.w. from Barcelona. Its streets are paved, but mostly narrow and crooked. It has 5 squares, 3 churches, several convents, a hospital, schools, etc. It is overlooked and defended by a castle with a strong battery. Pop. 6333, mostly employed in husbandry and as muleteers; the produce of the fields, vineyards, and olive-yards of the neighborhood giving rise to a considerable trade. Cotton fabrics are also manufactured in B., and this branch of industry is on the increase.

BERGAMA (ancient *Pergamos*), a city of Asiatic Turkey, vilayet of Khodavendikhiar, situated in a beautiful and fertile valley, on the right bank of the Caicus, about 40 m. n.n.e. of Smyrna. Lat. 39° 4′ n., and long. 27° 12′ east. In early times, the city was the capital of the kingdom of Pergamus (q.v.). Many ruins still exist to attest the former magnificence of Bergama. The present pop. of B. is about 15,000, four fifths of whom are Turks.

BER'GAMO (the ancient *Bergomum*), a fortified t. of Lombardy, situated on some low hills between the Serio and Brembo, about 29 m. n.e. of Milan, in lat. 45° 42′ n., and 9° 37′ east. B. consists of two parts—the upper city, wherein the nobility, an exclusive class, reside; and the Borgo, a suburb where business is transacted. Pop. '72, 34,555. B. is well built, has a castle occupying the most elevated part of the town, and a cathedral. Silk, cotton, linen, woolen fabrics, and iron goods are manufactured. It has also an extensive trade in grindstones, quarried in the vicinity. Annually, in the month of Aug., the largest fair in northern Italy is held here, at which money to the estimated amount of £1,200,000 is turned over. Under the Roman empire, B. became a municipal town of importance. It was destroyed by Attila, 452 A.D.; and after the fall of the Roman empire, it became one of the chief towns of the Lombard kings in this part of Italy, and capital of a duchy. After numerous changes, its inhabitants placed themselves under the protection of the Venetian Republic in 1427, and formed an integral portion thereof (with one exception of 9 years) until the subversion of the republic by Napoleon in 1797. Bernardo Tasso, the father of Torquato, and Tiraboschi, author of *The History of Italian Literature*, were natives of Bergamo. B. is the capital of the province of the same name, which has an area of 1015 sq.m., a pop. '71, of 368,152, and good pasturage for sheep and goats; iron, marble, lignite, and whetstones are also found.

BERGAMOT is the name of various kinds of pear, to which, however, no common distinctive character can be assigned. The name is used both in Britain and upon the continent of Europe. The proper B. pear is probably the *B. crasanne*, a flattish, rough-skinned pear with a long stalk. It has a very juicy pulp, as soft as butter, of an extremely pleasant flavor, and is esteemed as one of the best dessert pears. Metzger, in his work on the pomaceous fruits (*kernobstsorten*) of the s. of Germany (Frankfort, 1847), describes no fewer than 47 kinds of pears, which all bear the name of B., although some of them differ very widely from each other.

BERGAMOT is also the name of a species or variety of the genus *citrus* (q.v.), also called the B. ORANGE, or MELAROSA; by some botanists regarded as a variety of the orange (*C. aurantium*); by others, as a variety of the lime (*C. limetta*); and elevated by Risso to the rank of a distinct species, under the name of *C. bergamia*. Of its native country or origin, nothing can be told, except that it was probably derived, like its congeners, from the east. It is now cultivated in the s. of Europe; and from the rind of its fruit, the well-known OIL OF B. is obtained, which is extensively used in making pomades, fragrant essences, eau de Cologne, liqueurs, etc. The fruit is pear-shaped, smooth, of a pale-yellow color, and has a green, subacid, firm, and fragrant pulp. The essential oil is obtained by distillation, or by grating down the rinds, and then subjecting them to pressure, which is the better method. The oil is also obtained from other varieties or species of the same genus. It is of a pale-yellow color, or almost colorless. One hundred B. oranges are said to yield about 2½ ounces of oil. Oil of B. is frequently employed for diluting or adulterating the very expensive blue volatile oil of camomile (q.v.).

BERGEDORF, a t. of Germany, 10 m. e.s.e. from Hamburg. When Lübeck joined the Zollverein in 1868, it resigned to Hamburg, on payment of 200,000 thalers, its share in the government of B., and its small territory. Pop. of territory above 12,000. Part of this territory is known by the name of the Four Lands (*Vierländer*). It is inhabited by a well-conditioned and industrious population, much occupied in the cultivation of fruit and vegetables, not only for the market of Hamburg, but for that of London.

Peach and apricot orchards, and fields of strawberries: extend over great part of the district. Cattle-husbandry is also carried on, and much attention is devoted to the rearing of poultry. The people of the Four Lands are distinguished from their neighbors by peculiarity of dress, and even each of the four small communities from which the name has been derived has some distinguishing peculiarity of its own.

BERGEN, a seaport t. of Norway, in the province of the same name, situated on a promontory at the head of a deep bay, called Vaagen. Lat. 60° 24′ n., long. 5° 18′ e. With the exception of the n.e. side, where lofty mountains inclose it, B. is surrounded by water. It is walled, and additionally protected by several forts, mounting in all upwards of 100 guns. The entrance to the harbor is dangerous without a pilot; but within, it is safe and commodious. B. is built in a semicular form round the harbor, and has a picturesque appearance from the sea. A close inspection discovers it to be generally well and substantially built, but many of the streets are crooked and narrow. It has a cathedral, various churches, hospitals, refuges for the poor, public libraries, etc.; is the seat of a secondary judicial tribunal, of one of the three national treasuries, the diocese of a bishop, and the station of a naval squadron. Its chief manufactures are tobacco, porcelain, and cordage. It has numerous distilleries, and some ship-building yards. The principal trade of B., however, is its export of stock-fish (dried fish of the cod family) and cod-liver oil, which it obtains from the northern provinces. Twice a year, the Norlandmen come to B. with their fish, receiving in exchange for them such articles of necessity or luxury as they require. In March and April, as many as 600 or 700 vessels are to be seen in the harbor of B. at once, laden with the produce of the winter-fishing, and with skins and feathers. The summer-fishing is not quite so productive. The annual value of the stock-fish exported from B. is about 2,000,000 specie dollars (£450,000). In addition, it exports about half a million barrels of herrings, and 20,000 barrels of cod-liver oil, the finest of which is used for medicinal purposes and for lamps, the coarsest for dressing leather. The chief imports are brandy, wine, corn, cotton, woolens, hemp, sugar, coffee, etc. The climate of B. is exceedingly humid, but not unhealthy. B. was founded in 1069 or 1070, by Olaf Kyrre, who made it the second city in his kingdom, and it was soon raised to the first rank. In 1135, king Magnus had his eyes put out here by his rival, Harald Gille, who was himself murdered in B. a year after. In 1164, the legate of the pope crowned king Magnus Erlingson here; and here, a century afterwards, king Hakon was crowned. The black pestilence, which ravaged Norway, first made its appearance in B. in 1348, and the city has since been several times devastated by it. The first treaty entered into with any foreign nation by England was made with B. in 1217. But the English and Scottish traders were soon displaced by the merchants of the Hanse towns, who continued to exercise and abuse their monopoly until their supremacy was broken by an act issued by Frederick II. of Denmark, in 1560; and in 1763, their last warehouse fell into the hands of a citizen of Bergen. B. was long the most important trading town of Norway, but has been recently surpassed by Christiania. Pop. '75, 34,384.

BERGEN, a co. in New Jersey on the Hudson river; intersected by the Erie, New York and Oswego Midland, and Northern New Jersey railroads; 350 sq m.; pop. '80, 36,790. The chief geological feature is the Palisades, a perpendicular wall of rock forming the w. bank of the Hudson through the entire county, rising from 300 to 500 ft. above the water. The county is intersected by the Hackensack, Ramapo, and Saddle rivers. Market gardening for New York is a leading industry. Co. seat, Hackensack. Among its population are many descendants of the early Dutch settlers.

BERGEN, a province in s.w. Norway, on the Atlantic; area, including a part of Romsdal, 18,549 sq.m.; pop. '75, 356,561. The coast is indented by many fjords or gulfs, the largest being Hardangar Fjord. There are high mountains all over the province, but in the valleys around the fjords and streams, good pasturage is found. Cattle breeding and the herring fisheries are the main occupations. There are marble, and ores of copper and iron, but none are worked owing to want of fuel. Capital, Bergen.

BERGEN-OP-ZOOM, a t., formerly strongly fortified, in the province of North Brabant, Netherlands, about 20 m. n. of Antwerp, stands on the little river Zoom, at its entrance into the e. branch of the Scheldt. Lat. 51° 29′ n., long. 4° 17′ east. The importance of its position rendered it the object of many a contest. The Netherlanders made it one of their strongholds in their struggles with Spain. The prince of Parma besieged it in vain in 1588; three assaults by the Spaniards in 1605 also failed, as did the siege by the marquis of Spinola, in 1622, which, after a duration of 78 days and a loss of 10,000 men, was raised on the arrival of prince Maurice of Orange. The fortifications were afterwards strengthened by the engineer Cochorn, so as to give it the reputation of being impregnable. Yet the French, under count Löwendal, in 1747, after a siege of two months, and the springing of 41 mines by the assailants, and 38 by the defenders, took the place by storm. In the winter of 1794, it capitulated to Pichegru. Being incorporated with France in 1810, it was blockaded by the English in 1814, who, under sir Thomas Graham, attempted to surprise the fortress on the night of the 8th of Mar., with a force of 4000, but after carrying the greater part of the works, they were, through remissness in sending support, overpowered by the brave garrison, and either slain or

forced to surrender. The French gave up the fortress under the treaty of Paris. B. has manufactures of earthenwares, and a large trade in anchovies. Pop. '75, 9599.

BERGERAC, a t. of France, in the department of Dordogne, about 25 m. s.s.w. of Périgueux. It is situated in a fertile plain on the right bank of the river Dordogne, which is here crossed by a fine bridge of five arches. Its principal manufactures are paper, serges, hosiery, hats, earthenware, and iron and copper articles. It is the entrepôt of the trade of the department. The department of Dordogne is celebrated for its wine, which is called B. wine, and also *small champagne*. It is both white and red in color, and takes a high place among the Garonne and Bordeaux wines. B. was taken and fortified by the English in 1345, who, after being driven out by Louis of Anjou, again got possession of it, and retained it until 1450. B. suffered greatly in the religious wars. It was dismantled by Louis XIII. in 1621. Pop. '76, 10,610.

BERGH, HENRY, b. N. Y., 1823; educated at Columbia college, and author of several works of fiction, among them a drama called *Love's Attractions*, *Married Off*, *The Ocean Paragon*, *The Streets of New York*, etc. He was secretary of legation at St. Petersburg in 1863, and subsequently vice-consul. Nearly 20 years ago he became interested in the treatment of domestic animals, and in face of much opposition he succeeded, in 1866, in getting an incorporation of the "American Society for the Prevention of Cruelty to Animals." The work of the society commended itself to the better class of the people, and its growth was rapid and substantial. The report for the first year showed 101 prosecutions; 41 for beating horses or other animals with clubs, whips, etc.; 10 for conveying animals in a cruel and inhuman manner; 15 for driving horses unfit to be used; 3 for overloading; 12 for starving or abandoning horses or other animals; and 20 for various acts of cruelty to cattle, dogs, cats, poultry, etc. In the thirteen years ending with 1878, there were 6809 prosecutions, including, besides the offenses named, driving horses until they fell dead, dragging horses with broken legs through the streets, selling diseased animals, plucking poultry while alive, dog and cock fighting, using instruments of torture, malicious mutilating, wounding, or poisoning of animals, etc. When the society began operations, the common method of transporting sheep and calves was by tying their legs and piling them one on another in a truck, the driver not seldom seating himself comfortably upon the agonizing heap, and taking his ease, while they bleated and groaned beneath him. Now such animals are carried standing in large cages. The main room of the society contains a curious collection of the bits, spurs, gags, fetters, goads, and other instruments of torture heretofore used, fit to be shown with similar engines employed in the palmy days of the Spanish inquisition upon men and women who failed to believe in the dogmas held by their tormentors. Since the organization of Mr. B.'s society, 13 branches have been started in the state of New York. In the other states of the union and in Canada, there are now 62 societies devoted to the same object; and England and other foreign countries have followed the example. In Nov., 1878, the "International Society of America" held its first session to consider the question of the transportation of cattle. It must be added that the humane work begun by Mr. B. soon enlisted the sympathies of women, and some of his ablest assistants and most generous donors are found among the estimable ladies in New York and elsewhere. The present society has for six years published a journal to advocate its purposes, and its drinking hydrants for man and beast in various parts of the city and the parks keep it in constant memory.

BERGHAUS, HEINRICH, one of the most active promoters of geographical knowledge, was b. at Cleves, in Rhenish Prussia, 3d May, 1797, and educated at the gymnasium of Münster. As conductor of the road and bridge corps in the department of the Lippe, then (1811) part of the French empire, and afterwards in the Prussian army, he had opportunity to advance his knowledge of geodesy. In 1816, he was made "geographical engineer" in the war department in Berlin, and was employed on the trigonometrical survey of Prussia, and became (1824) professor of mathematics in the architectural academy of Berlin (a post he held till 1855), and (1836) director of the geographical school in Potsdam. The best known of his chartographical works is his *Physical Atlas* (90 plates, Gotha, 1838–48), which forms the basis of Johnston's work with the same title published in Edinburgh. He has been employed on an ethnographical map of Germany since 1848. As a writer, he has edited several geographical periodicals. His *Geog. Jahrbuch* (Geog. Annual), published since 1849, forms a supplement to the *Physical Atlas*. Of a more popular nature are his *Physicalische Erdbeschreibung* (Physical Descriptions of the Earth), *Grundlinien der Staatenkunde* (Outlines of the Political Character of States), and *Ethnographie*, all of which appeared at Stuttgard between the years 1846–50. In 1855, he published a work entitled *Was man von der Erde weiss* (What is known of Earth). In 1855–56, appeared an *Atlas der Oesterreichischen Monarchie*, and *Landbuch der Mark Braadenburg*. In 1862 appeared his *Landbuch von Pommern;* and in 1863, *Briefwechsel Alexander von Humboldt's mit H. Berghaus*.

BERGHEM, NICHOLAS, one of the finest of the Dutch painters, was b. at Haarlem, 1624, and studied painting first under his father, afterwards under Van Goyen, Weenix the elder, and other masters. He soon acquired an extraordinary facility of execution; and his industry, naturally great, was stimulated by the cravings of his avaricious wife, who thought he could never earn too much. Accordingly, he scarcely ever left his

studio, and we might wonder where he found all the materials for his landscapes, which now decorate the best collections of Europe; but he had carefully studied nature during his long residence at the castle of Bentheim. Warm coloring, natural and original grouping, and a general happy arrangement, are the leading features in B.'s landscapes. Strict criticism may object to some traces of lightness in execution, and may demand greater natural truth in some points, especially the outlines of animals; but these defects are lost in the general excellence of B.'s pictures. His etchings are highly esteemed. B. died in his native place, 1683.

BERGLER, JOSEPH, a historical painter of considerable note, was b. at Salzburg, 1753. Having studied under Martin Knoller at Milan for several years, B. went to Parma, where, in 1784, his picture of Samson being delivered by Delilah into the hands of the Philistines obtained the chief prize of the academy there. Returning to Germany, he, in 1786, settled at Passau, where he was appointed painter to cardinal Auersperg, prince-bishop, and in this capacity painted many fine altar-pieces. B. having been made director of the academy of Prague in 1800, removed to that city, where he continued to reside until his death in 1829. The impetus which he gave to the fine arts in Bohemia was very marked, and his school furnished a goodly number of eminent artists. His principal works are a *Cyclus*, or series of important events drawn from the history of Bohemia, in 66 sheets: "Libissa, Queen of the Fairies, deciding a Dispute between two Brothers for the Heritage of their Father;" "The Deliverance of Charles IV.;" and "Hermann and Thusnelda."

BERGMAN, TORBERN OLOF, a celebrated chemist of the 18th c., was b. at Katharinberg, West Gothland, Sweden, Mar. 9, 1735. He was sent at 17 years of age to the university of Upsala, with a view to prosecute studies qualifying him either for the church or the bar; but disliking both these professions, he devoted himself to natural history, physics, and mathematics, and soon made some interesting discoveries in entomology, while he also distinguished himself as an accurate astronomical observer. In 1767, B. was elected to the chair of chemistry at Upsala, and continued to fill it until his death, which took place at Medevi, in July, 1784. B. published a vast number of dissertations, the most important of which are collected into six octavo volumes under the title of *Opuscula Torberni Bergman Physica et Chemica* (Leip. 1779–81). His essay on *Elective Attractions* was translated into English by Dr. Beddoes.

BERG'MEHL, or MOUNTAIN-FLOUR, is a recent deposit of a white or cream-colored powder of extreme fineness, composed almost entirely of the indestructible silicious frustules or cell-walls of *diatomaceæ* (q.v.). From its resemblance to flour, it has been mixed with ordinary food, in seasons of scarcity, and thus used by the inhabitants of Norway and Sweden, who suppose it to be nutritious. When subjected to a red heat, it loses from a quarter to a third of its weight, the loss consisting probably of organic matter, and this would make it in itself nutritious; but it seems to derive its chief value from its increasing the bulk of the food, and rendering the really nutritious portion more satisfying. On the other hand, there have been experiments tending to show that B. does contain a very small proportion—3 or 4 per cent—of positive nutriment.

Similar deposits occur at Dolgelly in North Wales, at South Mourne in Ireland, and in Mull and Raasay in the Hebrides. The contained organisms show that these beds have been deposited in fresh water.

BERGUES, a t. of France, in the department of the Nord, about 5 m. s.s.e. from Dunkirk. It is situated on the Colme, at the foot of a hill, was strongly fortified by Bauban, and has the means of laying the valley under water. The canal of B., which admits vessels of 300 tons burden, unites it with Dunkirk and the sea, and its favorable situation makes it the entrepôt of the produce of the adjoining country. It has manufactures of soap, tobacco, and earthenware, and also sugar and salt refineries. B. was first walled and fortified by Baldwin II.; count of Flanders; and Baldwin IV. erected a splendid abbey, of which two towers only remain, in honor of St. Winnoc, who retired here in the beginning of the 10th century. Between the 13th and 16th centuries, B. suffered much from wars, and changed masters several times. Pop. '76, 5368.

BERGYLT, *Sebastes Norvegicus* or *Scorpæna Norvegica*, a fish of the mailed cheeks (q.v.) family, or *sclerogenidæ*—the family to which gurnards and sticklebacks belong—but so much resembling a perch in appearance, that it was formerly called *perca marina*, or sea-perch. It is sometimes called the Norway haddock, although it has no resemblance to the haddock. It is an inhabitant of all the northern seas, and is occasionally found on the British coasts at least as far s. as Berwick. It is of a red color, dark on the upper parts, reddish-white beneath. Its gill-covers are armed with short spines; the anterior rays of the dorsal fin are strong spines, the posterior portion of the fin has soft rays. The B. attains a length of two ft. or upwards. It is good for food, and the Greenlanders use it not only in a fresh but in a dried state. They take it by long lines and baited hooks in the deep bays of their coast.

BERHAMPORE', the name of two towns in British India.—1. B., in the presidency of Madras, is a military station in the district of Ganjam. It is in n. lat. 19° 20', and e. long. 84° 50', being 525 m. to the n.e. of Madras, and 325 to the s.w. of Calcutta. The cantonments, themselves on a rocky ledge, have to the s. and e. a plain of consid-

erable extent, on the nearer edge of which is the native town, with a pop. of (1871) 21,670.—2. B. or Burhampore, in the presidency of Bengal, is in the district of Moorshedabad, being on the left bank of the Bhagirathi or Bhagruttee, which, itself the first great offset of the Ganges, afterwards joins another great offset, the Jellinghee, to form the Hoogly. B. is in n. lat. 24° 5′, and e. long. 88° 17′, being distant from Calcutta by land and water respectively 118 and 161 miles. It has long been one of the principal military stations in British India. The grand square, inclosing a spacious parade-ground, is particularly striking; and the quarters of the European officers form handsome ranges of brick-built and stuccoed edifices. There are here a college, hospitals, and mission churches. B. is the seat also of a civil establishment; and the houses of its chief members, erected in convenient spots in the neighborhood, give the place an air or grandeur and importance. B., though at one time extremely unhealthy, from its low and moist site on the delta of the Ganges, has yet been so much improved by sanitary measures, as to be second to no spot of Bengal in salubrity. In the spring of 1857 B. acquired an unenviable celebrity as being the cradle of the disaffection which so speedily led to the massacre of Meerut. Pop. '71, 27,110.

BE'RI, a t. of India, in the British district of Rohtuck, Punjab, in n. lat. 28° 40′, e. long. 76° 40′, 36 m. w. by n. from Delhi. Pop. '68, 9,723.

BERIOT, CHARLES AUGUSTE DE, 1802–70; a composer and violinist, b. in Louvain. He was a precocious and original musician, remarkable for pure tone and refined taste. In 1835, he became the husband of the famous singer, Malibran. In 1842, he was made professor in the Brussels conservatoire, but resigned ten years after in consequence of failing eyesight. He was the author of a complete manual for the violin, and of a great number of popular compositions for that instrument.

BERJA, a t. of Spain, in the province of Andalusia, at the foot of the Sierra de Gador, about 22 m. w. of Almeira. It has manufactures of linen fabrics, hats, hardware, and leather, and a trade in wine and oil. Pop. about 8000, who are chiefly engaged in mining lead, which is plentiful in the Sierra de Gador. Agriculture is also prosecuted to some extent.

BERKELEY, a co. in n.e. West Virginia, between two branches of the Potomac, intersected by the Baltimore and Ohio railroad; 250 sq.m.; pop. '70, 14,900—1672 colored; in '80, 17,412. The surface is rough and not easily cultivated, but much grain, butter, and wool are produced. Co. seat, Martinsburg.

BER'KELEY, a small t. of Gloucestershire, 15 m. s.w. of the t. of Gloucester, on on the small river Avon, a mile and a half e. of its junction with the estuary of the Severn. Pop. of borough (1871), 1161; of parish 5690. The town lies in the fine vale of B., which is 25 m. long and 4 broad, between the Severn on the w., and beech-covered hills on the east. This vale consists of rich meadow pasture-land, on a deep, fat loam, and is celebrated for its dairies and cheese. The latter is the far-famed "double Gloucester," of which each cow yields 340 lbs. a year. Near B. is the entrance to the B. and Gloucester canal, navigable for vessels of 600 tons. Some trade exists in timber and malt. B. castle is an embattled building on an eminence s.e. of the town, and which, about 1150, was granted by Henry II. to Robert Fitzhardinge, with power to enlarge and strengthen it. Here Edward II. was murdered in 1327 by Maltravers and Gourney. In the civil wars of Charles I., the castle held out for the king, but was taken after a nine days' siege by the parliamentarians. In the castle is preserved the cabin-furniture of Drake the navigator. Dr. Jenner, the discoverer of vaccination, was a native of B., and is buried in the parish church of St. Mary here.

BERKELEY, GEORGE, bishop of Cloyne, and a distinguished philosopher, was the eldest son of William B., a cadet of the family of the earl of Berkeley. He was born on the 12th of Mar., 1684, at Kilcrin, near Thomastown, co. of Kilkenny, Ireland. As a boy, he studied at the school of Kilcrin, at which Swift also received his early education; and in his fifteenth year he followed his great countryman to Trinity college, Dublin, where, in 1707, he obtained a fellowship. At Trinity, he enjoyed the society of Swift, who patronized him, as he did almost everybody, and who subsequently had a great deal to do in shaping his fortunes.

B.'s career as an author began in 1707 (the year in which he obtained his fellowship) by the publication of a work written three years before, at the age of 20, entitled *Arithmetica absque Algebrâ aut Euclide Demonstrata*. This was followed, in 1709, by the celebrated essay, *Towards a New Theory of Vision*, in which he demonstrated the dependence of the perceptions of distance, magnitude, and situation on the sense of touch. This essay led to considerable controversy at the time, though its conclusions may now be considered as not admitting of doubt. In 1733, B. produced a pamphlet in vindication of it—viz., *The Theory of Vision or Visual Language, showing the Universal Presence and Providence of the Deity Vindicated and Explained*. By this time he had propounded his system of absolute idealism. His *Treatise concerning the Principles of Human Knowledge* appeared so early as 1710. Its object was to undermine the materialism of the age, by denying, on received principles of philosophy, the reality of an external world. If there is no external world, he argued, the phenomena of sense can be explained only by

supposing a deity continually necessitating perception. B. has since been laughed at by many who could not see how the premises laid in the philosophy of the day led to his system; by many he will always be laughed at as an idle dreamer; but, in point of fact, his system is a monument at once of marvelous subtlety of mind and of the most pious devotion of the intellectual powers to the cause of religion. The object was, as the full title of the book itself sets forth, to inquire into and remove the causes of scepticism, atheism, and irreligion. It is only an illustration of the truth of the old saying, that extremes meet, if, in following out this pious purpose, he prepared the way for a subtler form of scepticism (in Hume's philosophy) than the world had previously known. The reader will find valuable assistance to the apprehension of B.'s system in sir William Hamilton's *Discussions*, and in his dissertations and notes to Reid's *Philosophy of the Human Mind*. It must suffice to mention here that B. was the first philosopher who proposed a scheme of absolute idealism.

In 1713, B. went to reside in London, where, in the same year, he published a defense of his ideal system, *Three Dialogues between Hylas and Philonous*. Shortly after this he was appointed chaplain and secretary of legation under lord Peterborough, whom he accompanied to Italy. In 1721, he returned to London; and in 1724, he became dean of Derry, with an income of £1100, and resigned his fellowship.

B. was not a man to settle in the enjoyment of leisure and opulence. The dean of Derry set to devising schemes of usefulness, fixing at last on one by which his deanery and income were to be exchanged for exile and £100 a year. This was the Bermudas college scheme for training pastors for the colonies, and missionaries to the American Indians. Swift, failing to induce him to give the project up, made influence with ministers to support it, which they promised to do. Full of hope, B. prepared for his exile; he married in Aug., 1728, Anna Elvert, daughter of right hon. John Forster, speaker of the Irish house of commons, and soon after sailed for Rhode Island. The support promised by government was never given to him, and, after six years, he returned to England heart-broken with failure, and harassed by creditors. He had barely returned, however, when (1734) he received the bishopric of Cloyne, as a mark of favor from the queen. He was now once more in the enjoyment of leisure for literature. Soon appeared the *Minute Philosopher*, followed by various letters and pamphlets on the state of the country, and, in 1749, by *A Word to the Wise*. In 1744, he gave the world his notions of the virtues of tar-water in a book entitled *Siris*. Tar-water appears to have been in his thoughts as in his system—which must have been saturated with it—from this time till his death. His last work was *Farther Thoughts on Tar-water*, published in 1752. The fact is, he was hypochondriacal for many years before his death. He died, 14th Jan., 1753, at Oxford, whither he had gone to live with his son, who was studying at Christ church. A genial companion, an affectionate and steady friend, he was loved by all of his contemporaries who enjoyed his society; a graceful writer, a subtle philosopher, and an active churchman, his whole life was devoted to usefulness, and ennobled by the purity of his aspirations. The best edition of his works is that of prof. Fraser, LL.D., 1871.

BERKELEY, MILES JOSEPH, an English botanist, b. 1803; educated at Cambridge, a curate at Margate, and dean of Weldon. He is a fellow of the Linnæan and many other scientific societies; author of *Gleanings of British Algæ*, of the concluding volume of *English Flora*, articles on *Diseases of Plants*, papers on vegetable pathology, an introduction to *Cryptogamic Botany*, and works on fungi, mosses, etc.

BERKELEY, Sir WILLIAM, d. 1677; Governor of the colony of Virginia in 1641, keeping the colony loyal to the king until compelled by his friends to submit to Cromwell. 1651, when Richard Bennet was made governor. B. remained in the colony, and in 1660 was chosen governor by the general assembly. Years later he lost the favor of the people by failing to protect them from the Indians, and a rebellion against him led by Nathaniel Bacon (q.v.) almost succeeded, but failed in consequence of the sudden death of the leader. He was recalled in 1677. B. was the author of *A Discourse and View of Virginia* and a drama called *The Lost Lady*.

BERKELEY SOUND, the most frequented inlet of the East Falkland island, near its n.e. extremity. It is in lat. 51° 30′ s., and long. 57° 56′ west. Though it is difficult to enter, yet it contains several excellent harbors. Its shores yield ample supplies of water, cattle, and vegetables.

BERKELEY SPRINGS, or BATH, a t. and seat of justice of Morgan co., W. Va., near the Potomac, 77 m. w. of Washington; pop. 70,407. Persons suffering from dyspepsia, neuralgia, and chronic rheumatism, are benefited by the water.

BERKHAM'STEAD, GREAT, or BERKHAMSTEAD ST. PETER'S, a market t. of Hertfordshire, England, situated in a deep valley, on the right bank of the small river Bulborn, on the Grand Junction canal and the London and North-western railway, 28 m. n.w. from London. The main street is about 1 m. in length. The town is well built, mostly of brick. The parish church, a cruciform building in the center of the town, is chiefly in the perpendicular style. The father of the poet Cowper was rector of B., and the poet himself was born here. The town is supposed to be of Saxon origin, and the kings of Mercia had a palace or castle here. William the conqueror met the nobles and prelates at B., and took an oath to rule according to the ancient laws and customs of the

country. He bestowed the castle and manor of B. on his half-brother, the earl of Moreton. The castle was rebuilt in the reign of king John. The property having reverted to the crown, was bestowed by Edward III. on his son, the Black Prince, when he created him duke of Cornwall, and has since been held by the princes of Wales as dukes of Cornwall. A few massive fragments of the wall of the castle still remain, to the e. of the town. A free grammar-school was founded in the reign of Edward III., and still subsists, having been lately much enlarged and enriched by the establishment of several exhibitions. A charity-school was founded under the will of Thomas Bourne in 1727. Straw-plaiting is carried on to a considerable extent in B., and a vast number of wooden articles are made, as bowls, cricket-bats, hoops, toys, etc. There are extensive chemical works, and a considerable trade in timber, malt, and coals. There is a weekly corn-market. Pop. '71, 4083.

BERKS, a co. in s.e. Pennsylvania, on the Schuylkill, intersected by the Philadelphia and Reading, and Wilmington and Reading railroads; 920 sq.m.; pop. '70, 106,701. The Blue mountains are on the n.w., and the South mountain, or the Blue Ridge, traverses the central s.e. portion. The valley soil is fertile and well cultivated, and there are iron and copper mines of value. B. was settled by Germans more than a century ago, and its people still speak "Pennsylvania Dutch," together with English. Co. seat, Reading.

BERKSHIRE, a co. in Massachusetts, forming the entire w. border of the state; crossed by the Boston and Albany, the Pittsfield and North Adams, and the Housatonic railroads; 1000 sq.m.; pop. '78, 68,270. The surface is greatly diversified by mountains, forests, and streams. Saddle mountain is the highest point in the state. Grazing is a leading feature. Marble, limestone, and iron are found, and there are many manufactories of wool, cotton, leather, flour, paper, lumber, etc. The picturesque scenery has attracted from the large cities many residents, who have embellished the region with elegant rural homes. Co. seat, Pittsfield.

BERKSHIRE, a midland co. of England, bounded n. by Gloucester, Oxford, and Bucks, e. by Oxford and Bucks; s.e. by Surrey; s. by Hampshire, and w. by Wiltshire. Greatest length, 50 m.; average breadth, 15. Area, 752 sq.m., nearly one half of which is under tillage, one fourth in pasture, and one sixteenth in wood. B., which is one of the most beautiful of the English counties, lies in the valley of the Thames, and has an undulating surface, rising in some parts into hills. Older tertiary strata, consisting of the London clay, occupy the e. part of the county; cretaceous strata, the middle; and oolitic, the west. A range of chalk-hills, or downs, connected with the Chilterns on the e., and the Marlborough Downs on the w., crosses the country into Wiltshire, from Reading to Wallingford, attaining at White Horse Hill (so called from the gigantic figure of a horse rudely defined in the chalk—a relic of ancient times) a height of 893 feet. Between this range—the w. part of which is occupied by sheep-walks—and a smaller oolitic one skirting the valley of the Thames, is the vale of White Horse, the richest part of the county, and drained by the Ock. To the s. of the Downs is the fertile vale of Kennet, drained by the river of that name, and its feeder, the Lambourn. To the e. is the forest district, comprising Windsor forest, part of Bagshot Heath, etc. The forest chiefly consists of hazel, oak, beech, ash, and alder. The Thames skirts the whole n. border of the county, winding through a course of 100 m., but in a direct line, only 52, and navigable nearly the whole way. It is the chief river of B., the other rivers of the county being its tributaries; of which the chief are the Kennet, Leddon, and Ock. The Kennet is navigable for 30 miles. The climate of B. is very healthy, being mild in the valleys, and bracing on the high lands. The soil varies greatly: in the valleys, it is generally a fertile loam, with a subsoil of chalk, gravel, or clay. The country between the valleys of Kennet and White Horse consists chiefly of sheep-walks; and along the Thames, and to the w. of the Ridge Way, or Downs, it is chiefly dairy and pasture land. The chief crops are oats and wheat. "Double Gloucester" and "pineapple" cheese are exported in large quantities to London. There is a superabundance of horses. Swine are extensively reared, especially near Faringdon, the breed being one of the best in England. Property is very much divided, and the number of gentlemen's seats and villas is very great. The farms are generally of moderate size. The county is traversed by the Great Western railway and its branch lines, and by two canals. B. is divided into 20 hundreds, 151 parishes, and 12 poor-law unions. It returns 8 members to parliament, 3 for the county, 2 for Reading (the county town), and 1 each for Windsor, Wallingford, and Abingdon. Besides these towns, there are the municipal boroughs of Newbury (the scene of two severe conflicts in the civil war) and Maidenhead, and the market-towns of Faringdon, Hungerford, Wantage, Wokingham, East Ilsley, and Lambourn. The pop. of B. in 1871 was 196,475 (97,078 males and 99,397 females), showing an increase of 20,219 since 1861, when the pop. was 176,256, and of 85,995 or 78 per cent since the first census in 1801. The county has no manufactures of any importance. The British and Roman remains are numerous, including Roman roads and many camps and barrows. Of the old castles, the principal relic is Windsor (q.v.); of monastic establishments, the abbeys of Abingdon and Reading. The churches are small, and, from the scarcity of building-stone, are often constructed of chalk and flint. There are many Norman churches, erected in the 12th and 13th centuries.

BERLEBURG, or BERLEBURGER, BIBLE, published by unknown editors at Berleburg, in Germany, 1726–29. It is an original translation, with a running exposition, giving the literal, spiritual, and hidden or mystical interpretation. It has the characteristic excellences and defects of pietism.

BERLEN'GAS, a group of rocky islands in the Atlantic ocean, off the w. coast of the Portuguese province of Estremadura, and 10 m. n.w. of Peniche. The principal one, named Berlenga, is fortified, and has been used as a state-prison.

BERLICHINGEN, GOETZ or GOTTFRIED VON, "of the iron hand," a German knight of the 16th c., may, with Ulrich von Hutten, be considered as the last worthy representative of the chivalry of the middle ages, then expiring. He was b. at Jaxthausen, in Würtemberg, in the ancestral castle of his family, which may be traced back into the 10th century. His education was conducted by his uncle Kuno, with whom he attended the diet of Worms in 1495. He gratified his passion for war at first by taking part in several of the quarrels between German princes, and at the siege of Landshut lost his right hand, which was replaced by one of iron, yet shown at Juxthausen. When the general peace of the country had been established under Maximilian I., Goetz retired to his castle. But a restless spirit, and the general turbulence of the time, involved him in continual feuds with the neighboring barons and free cities, in which he displayed a mixture of lawless daring and chivalrous magnanimity. Having joined duke Ulrich of Würtemberg against the Swabian league, on the duke's expulsion, he was taken prisoner, and had to pay a ransom of 2000 florins. In the peasants' war of 1525, he took part with the insurgents, and was chosen leader of a part of their forces. In his narrative, he ascribes this step to compulsion; more likely it was his own restless and turbulent spirit, and a desire for revenge on his old enemies of the Swabian league. On the unfortunate issue of the war, he at first made his escape, but was afterwards fallen upon unawares by a band of leaguers, who extorted an oath that he would appear before the league when summoned. Accordingly, he had to appear at Augsburg, where he was kept in arrest for several years, and at last sentenced to perpetual imprisonment in his own castle, and, in case of his breaking this condition, to a fine of 20,000 florins. He passed eleven years in this state, and was only pardoned on the dissolution of the league. He died July 23, 1562, after having still taken part in campaigns in Hungary and in France. He wrote an account of his own life, published by Pistorius (Nürn. 1731; Bresl. 1813), which furnishes an excellent picture of the social life and manners of the period, and on which Goethe grounded his drama of *Goetz von B.*, translated by sir Walter Scott.

BERLIN', the capital of Prussia, and seat of the imperial government of Germany, one of the finest and most important cities of Europe, is situated on the Spree, in lat. 52° 30′ n., long. 13° 24′ east. The city is built upon a flat sandy plain, which, though cultivated, is far from being fertile. The Spree, at this place about 200 ft. wide, with a current so sluggish as scarcely to be perceptible, divides the city into two nearly equal parts, and communicates with the Oder and the Baltic by canals. A more unlikely site, in some respects, could hardly have been selected for a city, as, from its flatness, and the sandy character of the soil, much inconvenience results to the inhabitants: in summer, the heat reflected from the sand is very intense, and clouds of dust rise continually; while in winter, the cold is equally great. There being little or no declivity, water stagnates in the streets, producing effects which can easily be imagined. In the Friedrich's-strasse, about 2 m. long, there is not a foot of descent from one end to the other. Notwithstanding these natural disadvantages, however, the advance of the city, especially in late years, has been extraordinary. In 1861, the city covered an area of 14,000 acres, and in 1871 of 24,000 acres. In 1858, the pop. was 455,000; in 1871, it was 825,389 (including 21,000 soldiers); in 1875, 966,872. Although, as far back as the 13th c., the central part of the present city was inhabited, B. was long little more than a fishing-village; it was not till the great elector, Frederick William (1640–88), had united the separate duchies of which Prussia is now formed, that B. became of consequence as the most central town, and the capital of a large state. His successor, Frederick I., the first king of Prussia, followed the footsteps of his predecessor in enlarging and beautifying the capital; and at the close of his reign, in the end of the 17th c., the pop. numbered about 50,000. In the next century, it received accessions of French and Bohemian colonists, driven into exile by religious persecution. Every inducement was then held out to bring foreigners to settle in the rising city. Under Frederick the great, B. continued to prosper. At his death, the inhabitants numbered 145,000. After the peace of 1815, B. increased with extraordinary rapidity, and, being the seat of government, a focus of the arts and sciences, and a great center of commercial enterprise, it has gradually risen to a position which fairly entitles it to its present rank as the metropolis of the German empire.

The center of the city is now devoted almost exclusively to commerce, and round this part, extending considerably beyond the city boundaries, are congregated the residences of the citizens. Small towns and villages are gradually being incorporated with the great city; Moabit has already disappeared as a separate community, and Charlottenburg, a town of 18,000 inhabitants, is likely soon to follow. B. consists of ten different quarters and six suburbs, containing about 480 streets, 58 squares, 700 public buildings (including 60 churches), and 15,000 private

houses (comprising 169,000 dwellings or suites of apartments). The houses are built of brick, plastered or stuccoed outside, and they soon acquire a faded appearance. The style of these has very much altered since 1864. Prior to that, the greater portion of the houses were of one, two, or three stories, but these are fast giving way to houses of four, five, and more stories, the larger ones predominating. The increase in the value of house-property has been enormous, and the result is that great numbers of the people are driven to take up their abode in cellars under-ground. About one tenth of the pop. live in these cellars, huddled together in a manner that proves deleterious alike to their moral and their physical well-being. B. possesses a large number of very fine buildings. Of these may be mentioned the royal palace, the emperor's palace, and that of the crown prince; the royal library, which contains upwards of 700,000 volumes and 15,000 MSS.; the museums, the arsenal, and the guard-house. Most of those named are situated in the street "Unter den Linden" (so called from its double avenue of limes), one of the finest and most spacious streets in Europe. The city is further adorned throughout with numerous statues of military heroes, the equestrian statue of Frederick the great, by Rauch, being the most remarkable. In regard to educational institutions, B. occupies a high position; in 1873, there were ten gymnasia, with 5333 scholars, 54 arts and higher schools, 91 public and 96 private middle and elementary schools, making in all 251 schools in the city. In addition to these, there were in the same year 59 kindergarten (infant-schools). The university, established in 1810, possesses a very high reputation. Among the professors whose talents have rendered it famous are to be found such names as those of Fichte, Hegel, and Schelling. The number of students attending the university averages about 2000. Among the numerous institutions of B. may be mentioned the academy of sciences, by far the most important of the kind in Germany; the academy of architecture; the naval and engineering colleges; several seminaries for teachers and missionaries; asylums for the deaf, dumb, and blind; besides many learned societies. In 1870, there were 18 theaters in Berlin. About 90 per cent of the pop. are Protestants, 6 per cent Roman Catholics, and 4 per cent Jews. Church-going, however, seems to be very much neglected: of the total number of Protestants, fewer than 2 per cent, on an average, attend divine worship on Sundays!

The old museum contains antiquarian specimens, collections of coins, the gallery of ancient sculpture, the picture gallery, with about 1500 paintings. The new museum contains a very extensive and valuable collection of casts arranged in 12 saloons; the Egyptian museum, a fine collection of engravings numbering upwards of 500,000, etc. Outside the celebrated Brandenburg gate (erected in imitation of the propylæa at Athens, 70 ft. high, and 200 ft. wide) extends the Thiergarten, the largest and most important park near the town. To the s.w. of this lies the zoological garden, which has recently been considerably extended. Other places of interest worthy of mention are the aquarium, the new synagogue, the exchange, the opera-house, the royal château of Monbijou, the warrior's monument, and the monument of victory, 190 ft. high, recently erected in commemoration of the great victories of 1870–71, etc.

The commerce and manufactures of B. have increased so rapidly of late years, that it now ranks among the most important mercantile places of continental Europe. The staple commodities are grain, spirits, and wool. The principal branches of industry are engine-building, which gives employment to 14,700 workers iron-casting, and the manufacture of woolen and silk goods, and fancy articles; calico-printing is also largely engaged in. In respect of its publishing trade, B. now holds the second rank amongst German cities. In 1875, there appeared 353 journals, of which 33 were daily papers.

BERLIN, a city in Green Lake co., Wis., 94 m. w. of Milwaukee, on Fox river, reached by a branch of the Chicago, Milwaukee and St. Paul railroad; pop. 3341; in '80, 3375. It has several manufactories, and steam communication with Green bay, through lake Winnebago, and the lower Fox river.

BERLIN DECREES. See CONTINENTAL SYSTEM.

BERLINGHIE'RI, ANDREA VACCA, 1772–1826; an Italian surgeon, the head of a school of clinical surgery in the university of Pisa, who constructed instruments for operations in cystotomy, fistula, fracture of the femur, etc.; he improved other instruments, and wrote on professional subjects.

BERLIN SPIRIT, a coarse whisky made chiefly from beet-root, potatoes, etc. See DISTILLATION.

BERLIOZ, HECTOR, a fertile musical composer, was b. Dec. 11, 1803, at La-Côte-St.-André, in the department of Isère, France, where his father was a physician. Against his father's wishes, who intended him to follow the medical profession, he devoted himself to music, and proceeding to Paris, studied at the conservatoire de musique under Lesueur and Reicha. In 1828, the second prize at the conservatoire was awarded to him; and in 1830, his cantata of *Sardanapalus* won the first. He now went to Italy, where he resided about two years; and on his return, published several compositions, the merits of which were much canvassed. His works are too numerous for specification; but among the most successful are the symphonies of *Harold, Romeo et Juliette,* and the *Symphonie Funèbre et Triomphale,* the requiem for the funeral of gen. Damrémont, 1837; the overture to *Carnaval Romain,* and the *Hymne à la France,* per-

formed Aug. 1, 1844, by an orchestra of almost a thousand musicians. B. afterwards conducted many concerts in Russia, Germany, and England. In 1839, he was made a chevalier of the legion of honor; and in 1856, was elected a member of the institute at Paris. He was also librarian to the conservatoire. The peculiarity of the compositions of B. consists in their endeavor to make instrumental music the exponent of particular feelings as well as general emotions. Some critics are of opinion that this notion has led the composer into extravagance and incoherence; while others speak in high terms of the freshness and individuality which characterize his style, and look upon him as the chief of the romantic school of music. B. died 9th Mar., 1869.

BERM, in fortification, is a ledge or pathway, from 3 to 8 ft. in width, at the bottom of the outside of a rampart, where it joins the scarp or inner side of the ditch. It is almost on a level with the natural surface of the ground; and serves in part as a passage-way for the troops of the garrison, and in part as a means of preventing the ditch from being filled with earth and rubbish, when the rampart is battered by the besiegers.

BERMEJO, or VERMEJO, a river rising in Bolivia, flowing through several Argentine provinces, and joining the Paraguay about 30 m. above the mouth of the Parana. Its length is 1200 m., or double that of the direct line from head to mouth.

BERMOND'SEY, a s.e. suburb of London, on the s. bank of the Thames, and traversed by the Greenwich railway. It has extensive tanyards and wharfs. Pop. of parish (1871), 80,429.

BERMUDA GRASS, recently brought to the southern states from India; valuable both for pasturage and hay, especially in warm regions.

BERMU'DAS, or SOMMERS'S ISLES, were so named respectively from Bermudez, a Spaniard, who first sighted them in 1527, and from sir George Sommers, an Englishman, whose shipwreck here in 1609 was the immediate occasion of their being colonized from Virginia—itself only four years old—in 1611. This low and lonely archipelago is a mere group of specks, for, though it numbers perhaps 500 islets, yet it measures only about 12,000 acres in all; the whole occupying a space of about 20 m. in length by little more than 6 in breadth. The value of this natural fortress, which can hardly be overrated, arises from its situation. In lat. 32° 20′ n., and long. 64° 50′ w., the B. occupy, commercially and politically, a singularly commanding position. At a distance of 600 m. from cape Hatteras, in North Carolina, they are about equally remote from the n. of Maine and from the s. of Florida; again, between the two grand divisions of British America, they form an almost indispensable bond of union; and lastly, they flank, on either side, the two living highways which respectively lead from the n. Atlantic to the gulf of Mexico, and from the gulf of Mexico to the n. Atlantic. The four principal islands are—St. George's, 3½ m. in length; Bermuda, 15; Somerset, 3; and Ireland, 3, the breadth ranging between 2 m. and 1 furlong. The minor islands of St. David, Cooper, Smith, Long-Bird, Nonsuch, etc., form numerous picturesque creeks and bays of great size and depth, such as the Great Sound, Castle Harbor, Harrington Sound, and others. Most of the other members of the group are individually insignificant, many of them indeed without name or inhabitant. St. George's isle, the military station of the colony, commands the entrance of the only passage for large vessels—the narrow and intricate channel which leads to its landlocked haven being defended by strong batteries. From the strange shapes of most of the islands and the number of spacious lagoons, the communications are almost as necessarily by water as those of Venice; while the cedar-boats glide under the bluest sky, through an element so clear as to reveal, even to its lowest depths, the many varieties of excellent fish sporting among the coral rocks, and the exquisitely variegated shells. On the structure and formation of the archipelago, it is necessary merely to add, that it is the most northerly point on the globe where the living zoophyte still piles up its submarine architecture. The climate may be said to complete the paradise, resembling that of Persia, with the peculiar addition of a constant sea-breeze. Between Dec. and Mar., the thermometer ranges from 60° to 66°; in June, from 83° to 86°; and between April and Sept., from 75° to 79°. As the dew point ranges high, the air is moist at all seasons. With respect to productions, the entire soil presents under tillage of every description only 1227 acres; in grass for cattle-fodder, 33; and in wood or pasture, 10,339. Of the cultivated grounds, the main crops are potatoes, onions, and other garden-vegetables, arrow-root, maize, etc. Besides being useful as a station for those British vessels of war which are charged with the care of the West Indies on the one side, and the northern provinces on the other, Bermuda was formerly an important depot for convicts, but since the year 1862 it has ceased to be so. Between Bermuda and Halifax, Nova Scotia, there is a regular steamer carrying the mails. In 1871, the total pop. was 12,121. The numbers of white and colored persons are approximately in the proportion of five of the former to seven of the latter. The value of the exports for the year 1873 was £64,887, against £66,877 in the previous year; and that of the imports, £254,758 against £267,497. The governmental expenditure in 1874 amounted to £36,483. The revenue from rum shows a marked and progressive increase from the year 1865. In the B., emancipation has been decidedly beneficial, though here, as in Antigua, it was carried at once into full effect without the intermediate stage of apprenticeship. The group is under the authority of a governor, a council

of 9 members, and an assembly of 36. There are 12 free, and 9 private schools. With regard to religion, more than three-fourths of the population belong to the church of England, which has four clergymen. The Presbyterians, Wesleyans, and Roman Catholics have one minister each.

BERN, or BERNE, the most populous, and next to that of the Grisons, the most extensive canton of Switzerland; its area being nearly 2650 sq. m. It lies between lat. 46° 20′ and 47° 30′ n., and lon. 6° 50′ and 8° 27′ e. It has France on the n.; on the other three sides it is surrounded by its sister-cantons. B. is one of the three governing cantons of the Swiss confederation (since 1849 it has been the permanent seat of the Swiss government), and had, in 1877, a population of 532,632—about one fifth of the total inhabitants of Switzerland. Of these, 66,000 were Roman Catholics, the rest Protestants. The fertile valleys of the Aar and the Emmen divide the mountainous Alpine region in the s. from the Jura mountains in the north. The valleys of Simmenthal, Lauterbrunnen, Grindelwald, and Hasli, in the s., called the *Bernese Oberland*, are celebrated for their beauty. The lakes of Thun, Brienz, Neuchatel, and Bienne, are in B., which is watered by the Aar and its several tributaries. The climate, from the great difference in the elevations of the territory, is necessarily very variable, and subject to sudden changes, and frequent rains and fogs, but it is generally healthy. The districts of the Aar and the Emmen are the most fruitful, producing corn and fruits of various kinds, and affording excellent pasturage for cattle, which, with dairy produce, form the chief agricultural wealth of Bern. Corn and potatoes are not raised in sufficient quantities for home consumption. The vine grows in some districts, and hemp and flax in small quantities are raised. The horses of the Emmenthal are much prized. The lakes abound with salmon and trout. Iron, lead, and copper are found in the canton, which has also quarries of gypsum, marble, freestone, and granite. Its manufactures, which are not extensive, consist chiefly of linen, coarse woolens, leather, iron and copper wares, articles of wood, and watches. The canton is traversed by good roads, and its lakes and the river Aar are well supplied with steam-packets. The educational condition of the canton is good. B. entered the Swiss confederation, in which it now holds the second rank, in 1352. In the 15th and 16th centuries, it added to its possessions Aargau and Vaud, which it lost during the wars of the first Napoleon; but it received in return Bienne and its territory, and the greatest part of the bishopric of Basle. The present constitution of the canton, dating from 1846, is one of representative democracy.

BERN, capital of the above canton, is situated in lat. 46° 57′ n., and long. 7° 26′ e., on a lofty sandstone promontory, more than 1700 ft. above the sea, formed by the winding Aar, which surrounds it on three sides, and is crossed by two stone bridges, one of which is a magnificent structure, upwards of 900 ft. long, with a central arch 150 ft. wide and 93 ft. high. The fourth side was defended by fortifications, but these have been converted into public walks. B. has an imposing appearance from a distance, and a nearer view discloses one of the best and most regularly built towns in Europe, as it is the finest in Switzerland. The houses are massive structures of freestone, resting upon arcades, which are lined with shops, and furnish covered walks on both sides of the street. Rills of water flow through the streets, which are also adorned with numerous fountains. There are many fine public promenades in the environs, and the view of the Alpine peaks from the city is magnificent. The principal public buildings are a Gothic cathedral, founded in 1421, with some interesting tablets and relics; a new and magnificent structure, designed to accommodate the Swiss diet and administration; the mint, the hospital, and the university. B. has an interesting museum, and a valuable public library of 50,000 volumes. The manufacturing industry of B. is not great—gunpowder, firearms, leather, straw hats, and paper, are the chief articles. It has a considerable trade in the produce of the surrounding district. Pop. '70, 36,000. B. was founded by Berthold V., in 1191, who is said to have given it the name B., because he had killed a bear on the spot. A charter from Frederick II., in 1218, made it a free imperial city, and it gradually extended its possessions until it became an independent state; and between 1288 and 1339, successfully resisted the attacks of Rudolf of Hapsburg, Albert his son, and Louis of Bavaria. When the French entered B. in 1798, they found 30,000,000 of francs in the treasury. The corporate property of B. is very large—sufficient to defray all municipal expenses, provide the whole of the citizens with fuel gratis, and besides to leave a surplus for annual distribution among them. B. is the residence of foreign ministers; and since 1849, the permanent seat of the Swiss government and diet. Haller, the distinguished physiologist, was born at Bern. On account of the traditionary derivation of its name (old Suabian *bern*, a bear), bears have for several centuries been maintained in B. at the expense of the community. The French, when they captured B. in 1798, took possession of the bears, and sent them to the Jardin des Plantes, Paris; but the Bernese have since secured other specimens of their favorite animals, which are one of the "sights" of the city.

BERN, or BERNE, CONFERENCE or DISPUTATION OF, held in 1528, led to the establishment of the reformation in Bern. Some years before, the bishop of Lausanne demanded the indictment of certain preachers of reform doctrines, but the city council refused to interfere. The conflict increased steadily until, in Nov., 1527, the great council decided to settle disputes by appeal to the Word of God. Invitations were sent to

the principal bishops, and the leagues of both parties were asked to send delegates and learned men. The bishops declined, and Charles V. advised trust and recourse to the anticipated general council. But the B. council was held, and the event is considered to have been the turning-point in favor of the reformation. An account of the debates is found in D'Aubigne's *History of the Reformation.*

BERNADOTTE. See CHARLES XIV.

BERNALDA, a t. of s. Italy, in the province of Potenza, 32 m. w. by s. from Saranto. Pop. about 6000.

BERNALILLO, a large co. in New Mexico, bordering in part on Texas; 3000 sq.m.; pop. '70, 7591. It is watered by the Rio Grande del Norte, Rio de San Jose, and Rio Puerco. Co. seat, Albuquerque.

BERNARD, GREAT ST., *Mons Jovis,* a famous mountain-pass in the Pennine Alps, between Piedmont and the Valais. The pass attains an elevation of more than 8000 ft. above the sea-level; and almost on its very crest, on the edge of a small lake, which is frozen over 9 months out of the 12, stands the *hospice,* founded, in 962, by Bernard de Menthon, a Savoyard nobleman, for the benefit of pilgrims to Rome, and now largely taken advantage of by travelers across the Alps. The hospice, said to be the highest habitation in Europe, is occupied by 10 or 12 St. Augustine monks, who, with their noble dogs of St. Bernard breed, have rescued many hundred travelers from death by exposure to cold, or burial in the snow, which in winter ranges from 10 to 40 ft. in depth. The humanity of the monks shortens their own lives very considerably, the rigorous cold—which has been known to be 29°, and is frequently as low as 18° and 20° below zero F.—and the difficulty of respiration, often compelling them to leave with ruined health before they have completed the period of their vow—15 years. They enter on their humane mission at the age of 18. The hospice is a substantial stone-building, capable of affording sleeping-accommodation to 70 or 80 travelers, and shelter to about 300. As many as 500 or 600 persons have taken advantage of the hospitality of the monks in one day, and it is calculated that 8000 or 9000 travelers are annually indebted to their kindness. The resources of the monks are mainly derived from voluntary subscriptions and gifts, but they draw some trifle from independent property. Formerly, they had much more from this latter source, but a forced contribution of £4800 to the government of the canton of Valais impaired their revenues very much. The pass, which was traversed in early times by the Romans, Charlemagne, and Frederick Barbarossa, is celebrated for the passage of 30,000 French troops under Napoleon, in May, 1800.—LITTLE ST. B., which forms part of the chain of the Graian Alps, is the most convenient of the Alpine passes, and is supposed to have been the one by which Hannibal led his forces into Italy. It also possesses a hospice, which is situated 7192 ft. above the sea.

BERNARD, SAINT, of Clairvaux, one of the most influential theologians of the middle ages, was b. at Fontaine, near Dijon, in Burgundy, 1091; became a monk of Citeaux in 1113; founded a new branch of that order at Clairvaux, in Champagne, and himself became its first abbot in 1115; died Aug. 20, 1153; and was canonized by Alexander III., 1174. His ascetic life, solitary studies, and stirring eloquence, made him, during his lifetime, the oracle of Christendom. He was honored with the title of the "mellifluous doctor," and his writings were termed "a river of paradise." He rejected the doctrine of the immaculate conception, which had been introduced into the French church, and rose above the cruel prejudices of his age in repressing the monkish persecutions of the Jews in Germany. B. is perhaps most widely known in connection with the disastrous crusade of 1146. Charged by the pope to excite the religious zeal of the people of France and Germany, he accomplished his mission with fatally memorable success. Fields, towns, cities, and castles were in many places almost depopulated, and innumerable legions, fired by his prophetic eloquence, hurried to the east, nine tenths of whom never saw their homes again.

Regarding B. in his more spiritual aspect, we may say that his mystic, but at the same time practical, Christian doctrine was a wholesome antidote to the dry and cold scholasticism which prevailed among the churchmen of his age, although the intolerance with which he treated Abelard (see ABELARD) and Gilbert de Porrée must be reprobated. Luther says of St. B.: "If there ever lived on the earth a God-fearing and holy monk, it was St. B. of Clairvaux." In the course of his life, he founded 160 monasteries. His writings are exceedingly numerous. They consist of epistles, sermons, and theological treatises. Of the first, we possess 439; of the second, 340; and of the third, 12. They are all instinct with genius, though it is difficult for us now to appreciate their extraordinary influence. The best edition of the works of St. B. is that of Mabillon, printed at Paris in 1690 (2 vols. fol.), reprinted at Venice in 1750 (6 vols. fol.), at Paris in 1835–40 (4 vols. 8vo), and again in 1854 (4 vols. 8vo). The monks of the reformed branch of the Cistercians, which he instituted, are often called, after him, Bernardines. He gave name also, in France, to the nuns of the Cistercian order, which his sister, St. Humbeline, is said to have founded.

BERNARD, CLAUDE, a distinguished physiologist, was b. at Saint-Julien, near Villefranche, in the department of the Rhone, on the 12th July, 1813. He studied medicine at Paris; was admitted in 1839 as a pensioner in one of the hospitals; and in 1841,

became Magendie's assistant at the college of France. He graduated in 1843 as doctor in medicine, and ten years later, as doctor in science; and was appointed in Feb., 1854, to the chair of general physiology in connection with the faculty of sciences in Paris. The same year he was chosen member of the academy of sciences; and in 1855, he succeeded Magendie as professor of experimental physiology in the college of France. B.'s first researches were devoted to the physiological action of the various secretions of the alimentary canal. His memoir, published in 1844, in the *Gazette Médicale*, treats of the mechanism by which the gastric juice is secreted, and also of the modifications which alimentary substances undergo from that liquid. To the *Comptes Rendus* of the biological society he also contributed papers on the saliva, on the intestinal juice, on the influence of the different pairs of nerves on the digestive apparatus, and on the respiratory and circulatory systems. His first really original paper, however, was that on the function of the pancreas, in which he demonstrated that that viscus is the true agent of the digestion of fatty bodies. This essay obtained, in 1849, the grand prize in experimental physiology, and was printed in the *Comptes Rendus* of the academy of sciences in 1856. In 1849, appeared his first researches on the glycogenic function of the liver, establishing the doctrine that the blood which enters the liver does not contain sugar; while blood which leaves that organ, and goes to the heart by the hepatic veins, is charged with it. He also showed the influence of the nervous system on this function, and produced artificial diabetes by division of the pneumogastric. For this discovery, which was keenly criticised, but is now regarded as sound, he obtained, in 1851, the grand prize in experimental physiology. In 1852, he laid before the institute his experimental researches on the great sympathetic system, and on the influence exerted by division of this nerve on the animal heat. This paper procured him, for the third time, the prize of experimental physiology in 1853. Since 1854, when he succeeded Roux as member of the institute, he has continued his researches on the glycogenic function of the liver, and has also published his courses of lectures at the college of France, on *Experimental Physiology in its Application to Medicine* (1855–56); on *The Effects of Toxic and Medicated Substances* (1857); on *The Physiology and Pathology of the Nervous System* (1858); on *The Physiological Properties and the Pathological Alteration of the various Liquids of the Organism* (1859); on *Nutrition and Development* (1860); and his *Introduction to the Study of Experimental Medicine* (1865). In 1862, he became officer of the legion of honor; in 1867, commander; and in 1869 he was made a member of the academy. He died at Paris, 10th Feb., 1878.

BERNARD, Sir Francis, 1714–79; a colonial governor of Massachusetts and New Jersey; an English lawyer who favored the crown and brought troops into Boston, proroguing the general court because that body refused to vote supplies for the soldiers. In 1769, he was recalled, and his departure was made an occasion of general public rejoicing.

BERNARD, Jacques, 1658–1718; a native of Dauphiny, professor of philosophy and mathematics, and minister of the Walloon church at Leyden. He was educated at Geneva, and was minister over two churches in France, but was obliged to leave the country because he persisted in preaching the reformed doctrines in opposition to the royal ordinance. In Holland he was well received. He wrote an *Abridgment of the History of Europe* (unfinished), and began *Historical Letters* (continued by others). He wrote much for the *Bibliotheque Universelle; Negotiations, etc., at the Peace of Ryswick;* and continued Bayle's *Nouvelles de la Republique des Lettres.*

BERNARD, Simon, 1779–1839; a French engineer and gen.; aid to Napoleon; educated in the Paris polytechnic school. He served in several campaigns after 1800, and was conspicuous for defending Torgau for three months during a vigorous siege. He adhered to the restoration, but was ordered to leave France, which he did under permission to go to the United States. In this country he was employed by the government in devising canals and roads for connecting the great lakes and rivers, and also in coast defense and frontier fortifications, projecting fortress Monroe, and some of the defenses around New York. After the revolution of 1830, he returned to France, and prepared plans for the fortification of Paris. He was minister of war in 1834, and again in 1836–39.

BERNARD DOG, Great St., a race or variety of dog deriving its name from the hospice of St. Bernard, where it has been long kept by the monks for the purpose of assisting them in the rescue of perishing travelers. Dogs of different races are employed in the same manner at other passes of the Alps. The St. B. dog is remarkable for great size, strength, and sagacity. The dogs not only accompany the monks and servants of the hospice in the benevolent excursions which they regularly make through the most dangerous parts of the pass, but are sent by themselves to search for travelers who may have wandered, and this their extremely acute scent enables them admirably to do. They learn to know what places are most proper to be searched, and some of them show great alertness when the weather assumes a threatening aspect, as if desirous to be at their work. They carry a small flask of wine or brandy attached to their neck, of which the traveler may avail himself. When they find a traveler benumbed with cold, or discover by the scent that one has been overwhelmed in an avalanche, they endeavor by loud barking to attract the monks to the spot: if they fail in this, and if the traveler is

too much exhausted to proceed by their guidance to the hospice, or if they cannot by their own efforts dig away the snow which has covered him, they run to give the alarm by signs which are at once understood. One famous dog, called Barry, in the earlier part of the present century, was instrumental in saving the lives of no fewer than 40 human beings. His most memorable achievement was the rescue of a little boy, whose mother had been destroyed by an avalanche, and whom he induced to mount his back, and so carried him safe to the hospice. The skin of this dog is preserved in the museum of Bern.—The origin of this valuable race of dogs is not well ascertained, although they are supposed to have sprung from the progeny of a Danish dog left at the hospice by a traveler, and of the Alpine shepherds' dogs. Another account represents an English mastiff as one of their progenitors. There are two subvarieties, however; one with rough hair, like that of the Newfoundland dog, and of a white color, with black or tawny spots; the other, with close, short hair, more or less clouded with gray, liver-color, and black. Of the former breed, the number is now small. The head and ears resemble those of a water-spaniel, and the St. B. dog has therefore been sometimes classed with spaniels (q.v.).

BERNARDIN, SAINT, of Sienna, b. in 1380 at Massa-Carrara, of a distinguished family, made himself famous by his rigid restoration of their primitive rule amongst the degenerate order of the Franciscans, of which he became a member in 1404, after having already, in 1397, joined the brotherhood of the *Disciplinati Mariæ*. In 1438, he was appointed vicar-general of his order for Italy. B. was unwearied and devoted in his activity during the great Italian plague of 1400, both as an impressive preacher and an attendant upon the sick and dying. He founded the *Fratres de Observantia*, a branch of the Franciscan order, which already numbered more than 300 monasteries in Italy during his day. B. died in 1444, and was canonized by pope Nicholas V. in 1450, his festival being on the 20th of May. His eminently mystical works were published by Rudolf (4 vols., Venice, 1591), and by De la Haye (5 vols., Paris, 1636).

BERNARDINES. See CISTERCIANS.

BERNARDO DEL CARPIO, son of Don Sancho de Saldanha and Ximena, the sister of Alfonso II. of Leon, who had been secretly married. On learning of the affair the king imprisoned Don Sancho and had his eyes put out, and the wife was sent to a convent. The boy was brought up at court and gained early renown in the wars against the Moors, becoming one of the most famous soldiers of the 9th century. Incensed because he could not obtain his father's liberty, B. went over to the Moors and established himself in the strong castle of Carpio, whereupon the king promised to release the father if B. would surrender the fortress. It is uncertain what became of the father, who was not set free; but history states that B. went to France, where he became a wonderful knight errant. His name occurs frequently in romance, chronicles, ballads, and plays, and is the title of an epic poem published in 1624. Lope de Vega makes him a national hero and the conqueror of Roland at Roncesvalles.

BERNARD OF CLUNY, monk of Cluny, under the abbot Peter the venerable, about 1122–56; author of a long poem in Latin called *Contempt of the World*, which ranks with *Dies Iræ*, *Stabat Mater*, and other mediæval church literature. Several modern hymns are portions of B.'s poems, such as *Jerusalem the Golden*, *Brief Life is here our portion*, etc.

BERNAUER, AGNES, the beautiful daughter of a poor citizen of Augsburg, in the 15th c., whose sad story looks liker romance than history. Duke Albrecht of Bavaria, only son of the reigning duke Ernst, saw the maiden at a tournament at Augsburg, given in his honor by the nobility, and fell violently in love with her. Albrecht was young, handsome, and manly, and Agnes was not insensible to his attractions and his rank; but she was too pure to listen to his overtures till he promised to marry her. They were then secretly united, and Albrecht carried his young wife to the castle of Vohburg, which he inherited from his mother. Here they enjoyed their matrimonial happiness undisturbed, till Albrecht's father formed the plan of marrying his son with Anna, daughter of Erich, duke of Brunswick. The determined opposition he met with soon made him aware of his son's attachment to the Augsburger's daughter, and of the strength of his passion for her; and he resolved to take energetic measures to break it off. He accordingly contrived that, at a tournament at Regensburg, the lists were shut against his son, as one that, against the rules of chivalry, was living with a woman in licentiousness. Albrecht swore that Agnes was his wife, but in vain; he was still excluded. He now made Agnes be openly honored as duchess of Bavaria, gave her a numerous retinue of servants as a princess, and the castle of Straubing for a residence. She, full of sad forebodings of a dark fate, erected in the Carmelite convent of the place an oratory and a tomb. As long as duke William, Albrecht's uncle, lived, who was greatly attached to his nephew, nothing further was attempted against the happiness of the lovers. But after his brother's death, duke Ernst no longer restrained his anger, and, in the absence of Albrecht, ordered Agnes to be arrested and executed without delay. Accused of sorcery, by which she was alleged to have bewitched Albrecht, she was carried, bound hand and foot, by the executioners to the bridge of the Danube, and in the presence of the whole people thrown into the river (Oct. 12, 1435). The current having floated her again

to the side, one of the executioners ran with a long pole, and fastening it in her golden hair, held her under the water till she was drowned. Maddened at this atrocity, Albrecht took up arms against his father, and, in league with his other enemies, wasted the country. It was in vain that duke Ernst entreated his son to relent. It was not till the emperor Sigismund, and the other friends of the family, united their exhortations, that Albrecht at last returned to his father's court, where, after a time, he consented to marry Anna of Brunswick. To regain the forfeited regard of his son, duke Ernst had a chapel erected over the grave of the murdered lady, and Albrecht founded in the year of her death daily masses for her in the Carmelite monastery at Straubing; even after twelve years he renewed the foundation, and had the bones of his "honored wife" transferred to the tomb provided by herself, and covered with a marble monument. The unhappy loves of Albrecht and Agnes were long the theme of popular song; and the story has been made the subject of at least three tragedies, one by Jul. Körner (Leip. 1821), another by A. Böttger (3d ed. Leip. 1850).

BERNAY, a t. of France, in the dep. of Eure, pleasantly situated on the right bank of the Charentonne, 26 m. w.n.w. of Evreux. Pop. '76, 6087. Woolen, linen, and cotton manufactures are actively carried on, also paper-making, bleaching, dyeing, and tanning. There is a considerable trade not only in the products of these manufactures, but in grain, cider, horses, and cattle. B. is the seat of the greatest horse-fair in France, which is held in Lent, and is attended by nearly 50,000 persons, who congregate from all parts of France, chiefly to purchase post and diligence horses, for which Normandy has long been celebrated. B. is the seat of a tribunal of commerce. The church of St. Croix has a large and magnificent altar, and marble statues and sculptures: the church of La Conture was formerly celebrated for the cure of persons possessed of evil spirits. The grain-market occupies part of the remains of an interesting old abbey church. B. has a communal college, and a hospital.

BERNBURG, a t. in the German duchy of Anhalt, till 1863 capital of Anhalt-Bernburg, lies on the Saale, 23 m. s. of Magdeburg, in lat. 51° 47′ n.; long. 11° 45′ east. Two parts of B., surrounded by walls, lie on the left bank of the river, and are united by a bridge with the third part on the opposite side, which has a castle, but is not walled. B. is well built, has several literary and charitable institutions, and manufactures of porcelain, paper, and starch. Pop. '75, 16,929.

BERNERS, or BARNES, LADY JULIANA, prioress of Sopewell nunnery, near St. Albans, England, was a daughter of the sir James Berners who was beheaded in the reign of Richard II. The daughter was celebrated for beauty, spirit, and passion for field sports. One of the earliest productions of English printing is attributed to her pen: *The Treatyses pertynyng to Hawkynge, Huntynge, and Fysshinge with an Angle; and also a right noble Treatyse on the Lygnage of Cot Armours, endynge with a Treatyse which specifyeth of Blasynge of Armys.* A part of this was printed as early as 1486. The information on hunting is hitched into rhyme, but has no discernible relation to poetry.

BERNHARD, Duke of Weimar, a celebrated German general, was b. 6th Aug., 1604. He was the youngest of the eight sons of John, third duke of Saxe-Weimar. On the outbreak of the thirty years' war, he took the side of Protestantism against the emperor, and first distinguished himself in 1622 at the bloody battle of Wimpfen. Subsequently, he became colonel in the army of Christian IV., king of Denmark; took part in the bold expedition of Mansfield through Silesia to Hungary; and, after the sudden death of the latter, reunited himself with the Danes under the markgraf of Baden-Durlach. At the solicitations of his brothers, however, he now withdrew from the Danish service, and returned to Weimar in Mar., 1628. Three years later, Gustavus Adolphus made his appearance in Germany, and B. was one of the first who flew to his standard. After a brilliant career, he became suddenly ill, and died at Neuburg on the Rhine, 8th July, 1639; according to some, of a pestilential disorder then prevalent in the camp; but according to B.'s own opinion, and that of others, of poison, administered by his physician, Blandini, who is supposed to have been in the pay of France.

BERNHARDT, SARA, b. about 1845; the daughter of a Jewish father and a Dutch mother. The mother brought her, a mere child, from Amsterdam to Paris, and placed her in a convent at Versailles, where she remained several years. On leaving the convent she was asked what she intended to become. The reply was, "An actress at the Comédie Français, or a nun." Obtaining admission to the conservatoire she soon exhibited marks of talent. She made her first appearance in 1862 as *Iphigenica*, in Victor Hugo's version of the old Greek tragedy of *Iphigeneia in Aulis*, and she was at once successful. Afterwards at the Comédie, at the Gymnase, at the Porte St. Martin, and others, she appeared in such plays as *Phædre*, *Britannicus*, *The Marriage of Figaro*, *The Stranger*, *Rome Vaincu*, etc., always with increasing success. Perhaps her strongest character is *Donna Sol*, in Victor Hugo's *Hernani*. In 1879, she appeared in London with great success. Efforts, thus far unsuccessful, have been made to bring her to the United States. She is not only an actress of wonderful brilliancy, but a sculptor of no mean repute, and also something of a painter. In person she is remarkable; a thin, attenuated, nervous organization, but little more than a skeleton, but as full of life as the most robust of creatures. Her private life is peculiar; she dresses for the most part in trousers and pea-jacket, a

suit that might well enough be worn by a man, and she exercises all the legitimate freedom that might become a young and independent bachelor.

BERNI, Francesco, called also Berna or Bernia, a favorite Italian poet, from whom comic or jocose poetry has the name of *Versi Berneschi*, was born at Campovecchio, in Tuscany, about 1490. He first entered the service of cardinal Dovizio da Bibiena, and was afterwards for several years secretary to Ghiberti, chancellor to Clement VII., and bishop of Verona. About 1533, he betook himself to Florence, where he was made a canon, and lived in favor with the two Medici, duke Alessandro, and cardinal Ippolito, till his death in 1536. His *Opere Burlesche* (2 vols., Flor. 1548; Lond. 1721) are to be found in the *Classici Italiani* (Mil. 1806). His recast or rifacimento of Boiardo's *Orlando Innamorato* was received with such favor that it was thrice reprinted from 1541 to 1545. A critical edition was published at Florence, 1827. Berni's version, or dilution, is still read in Italy, in preference to the original.—Count Francesco Berni, b. 1610, d. 1693, the author of eleven dramas, and some lyric pieces, is not to be confounded with the former Berni.

BERNIER, François, a French physician and traveler, was born at Angers, in France. Having taken his degree of doctor at Montpellier, he departed for the east about 1654, and visited Syria, Egypt, Arabia, and India, in the last of which countries he resided for twelve years in the capacity of physician to Aurungzebe. On his return to France, he published an account of his travels in India in 1670–71. The work is delightful in style, accurate in the delineation of manners and customs, as well as in the descriptions of places, and clear in the exposition of the causes of those political events that carried Aurungzebe to the throne. He visited England in 1685, and died at Paris on the 22d of Sept., 1688.

The titles of his chief works are as follows: *Voyages de M. Bernier contenant la Description des Etats du Grand Mogol, de l'Indoustan, du Royaume de Cachemire*, etc.; *Mémoire sur le Quiétisme des Indes; Abrégé de la Philosophie de Gassendi; Sentiment de M. Descartes.*

BERNI'NA, a mountain of the Rhætian Alps, upwards of 13,000 ft. high, in the Swiss canton of Grisons, with a remarkable and extensive glacier, Morteratsch. The B. pass, which attains an elevation of 7695 ft., and over which a carriage road has been constructed, unites the valleys of the Engadine and Bregaglia on the n. with the Valteline on the s., but is dangerous on account of avalanches.

BERNI'NI, Giovanni Lorenzo, a famous Italian sculptor and architect in the time of pope Urban VIII., was b. at Naples, 1598. He early devoted himself to sculpture, and in his eighteenth year finished his admired group of Apollo and Daphne, which gave promise of greater excellence than was afterwards realized by the artist. Pope Urban VIII. employed B. to produce designs for the embellishment of the Basilica of St. Peter at Rome. The bronze *baldacchino*, or canopy, covering the high-altar of that edifice, the palace Barberini, the front of the college de Propaganda Fide, the church of Sant' Andrea à Monte Cavallo, and numerous ornaments in St. Peter's, are by Bernini. His greatest work in architecture is the colossal colonnade of St. Peter's. In 1665, B. accepted the flattering invitation of Louis XIV., and traveled to Paris with a numerous retinue and great pomp. In Paris, he resided above eight months; but not wishing to interfere with the designs of Claude Perrault for the Louvre, he confined himself entirely to sculpture. His visit, however, proved a highly remunerative one. Richly laden with gifts, he returned to Rome, where he died, Nov. 28, 1689, leaving a large fortune (about £100,000) to his children. Besides his works in sculpture, B. also left numerous paintings behind him. No artist, perhaps, was ever so much admired and rewarded during his lifetime as B.; but time has rather subtracted from than added to his fame.

BERNOUIL'LI was the name of a family that produced a succession of men, who became famous over all Europe for the successful cultivation and extension of various branches of mathematical and physical science. The family originally resided in Antwerp, whence, in 1583, its attachment to the reformed religion forced it to seek an asylum in Frankfort. Afterwards, the Bernouillis settled in Basel, where they achieved the highest professional honors. Eight of them became highly distinguished; but special mention can be made here only of the three most celebrated—James, John, and Daniel.

James B. was b. at Basel, 25th Dec., 1654, where he also d., 16th Aug., 1705. He devoted his life to the study of mathematics, of which he became professor in the university of Basel, succeeding in that chair the distinguished Megerlin. Among his first works were, *A Method of Teaching Mathematics to the Blind*, and *Universal Tables on Dialling*. These were followed by *Conamen Novi Systematis Cometarum*, being an essay on comets, suggested by the appearance of the comet of 1680; and an essay *De Gravitate Ætheris*. Besides a variety of memoirs on scientific subjects, he published no other work of importance. *De Arte Conjectandi* was a posthumous work concerning the extension of the doctrine of probabilities to moral, political, and economical subjects. His memoirs will be found in the *Journal des Savans and Acta Eruditorum;* his collected works were published in 2 vols. 4to, at Geneva, in 1744. Among his triumphs are to be recorded his solution of Leibnitz's problem of the isochronous curve, his determination

of the catenary, and investigation of the properties of isoperimetrical figures. At his request a logarithmic spiral was engraved on his tomb, with the motto, *Eadem mutatâ resurgo.*

JOHN B., brother of the preceding, was b. at Basel, 27th July, 1667. He and James were the first two foreigners honored by being elected associates of the academy of sciences at Paris, and members of the academy of Berlin. John devoted himself to chemical as well as to mathematical science. In 1694, he became a doctor of medicine, and soon after professor of mathematics at Gröningen, whence he only removed to succeed his brother James in the university of Basel. His forte was pure mathematics, in which he had no superior in Europe in his day. He died 1st Jan., 1748. Among his achievements are the determination of the "line of swiftest descent," and the invention of the "exponential calculus." His collected works were published at Geneva, in 4 vols. 4to, 1742; and his correspondence with Leibnitz, in 2 vols., 1745.

DANIEL B., b. at Gröningen, 9th Feb., 1700, d. at Basel, 17th Mar., 1782, was the son of John. Like his father, he devoted himself to medicine as well as to mathematics. The family reputation early helped him to the professorship of mathematics at St. Petersburg, which he held for several years. Thence, however, he ultimately retired to Basel, much against the will of the czar. At Basel, he occupied in succession the chairs of anatomy and botany, and of experimental and speculative philosophy. He published various works between 1730 and 1756, of which the chief are concerned with pneumatical and hydro-dynamical subjects. [This name is preferably, BERNOULLI.]

BERNOULLI, JACQUES, brother of the third John, b. 1759. His inclination was towards geometry, in which he received instruction from his father and afterwards from his uncle Daniel. At the age of 21 he undertook the duties of the chair of experimental physics, which his uncle resigned on account of old age. He advanced rapidly, and soon became a member of each of the scientific societies of the continent. In 1789, he married a grand-daughter of the great mathematician, Euler, but the wedding was followed in a few weeks by the drowning of the husband in the Neva. His papers are in the Acts of the St. Petersburg academy, and in other academical memoirs.

BERNOULLI, JEAN, 1710–90; youngest brother of Nicolas; he studied mathematics and law, and was for five years professor of eloquence in the university of Basel. He succeeded his father as professor of mathematics, and was thrice a successful competitor for prizes of the Paris academy of sciences. He was a friend of Maupertuis, who died in his house.

BERNOULLI, JEAN, 1744–1807; one of the three Bernoullis named John, distinguished in science—grandfather, father, and son. At the age of 13 he took the degree of doctor in philosophy, and at 19 was made astronomer royal of Berlin. He traveled in England and over Europe, and his writings consist of travels, and works on astronomy, geography, and mathematics. In 1774, he published a French translation of Euler's *Elements of Algebra.*

BERNOULLI, NICOLAS, 1695–1726; the eldest of three sons of John B., the mathematician. Nicolas at the age of 8 could speak German, Dutch, French, and Latin; at 16 he took the degree of doctor in philosophy from the university of Basel, and at 20 he received the highest degree in law. He filled the chair of jurisprudence at Bern, and he and his brother Daniel were at the same time professors of mathematics in the academy of St. Petersburg, where Nicolas died at the age of 31. The empress Catherine honored his memory with a public funeral.

BERNOULLI, NICOLAS, 1687–1759; cousin of Nicolas, Daniel, and John, son of a senator of Basel. He was a friend of Newton and Halley, visiting them in England. He filled the mathematical chair at Padua, once occupied by Galileo, and was professor of logic and law at Basel. He edited some of his uncle James's works, and his own writings are in the *Acta Eruditorum*, and the learned publications of the period.

BERNSTEIN, GEORGE HEINR., a distinguished orientalist, professor of oriental languages in the university of Breslau, was b. 12th Jan., 1787, at Kospeda, near Jena, where his father was pastor. In 1806 he entered the university of Jena, where he devoted himself to the study of theology, philosophy, and eastern languages. In 1812 he was appointed extraordinary professor of oriental literature in Berlin, and in 1821, regular professor. In 1843, he was appointed to Breslau. Besides a number of lesser treatises, and of contributions to scientific and critical journals, he established his reputation as an oriental scholar by the publication of an Arabic poem of Szafieddin of Hilla (Leip., 1816). But his greatest achievements were in Syriac literature. Besides several pamphlets, expository and critical, which appeard between 1837 and 1847, B. has given in his lexicon to Kirsch's *Chrestomathia Syriaca*, of which he brought out a new edition (2 vols., Leip. 1832–36), proofs of his diligent and successful research in the domain of Syriac lexicography. He contemplated publishing a great Syriac lexicon, but did not live to complete the work. He died 7th April, 1860.

BERNSTORFF, ANDREAS PETER, Count, 1735–97; cousin of Johann, and also a statesman of Denmark, privy councilor, and minister of foreign affairs. He first pro-

posed armed neutrality to Sweden. Late in life he prepared for the abolition of serfdom in Schleswig-Holstein, and gave full liberty to the press of that duchy.

BERNSTORFF, JOHANN HARTWIG ERNST, Count, 1712–72; a Danish statesman who was the representative of the government at the diet of Ratisbon; minister to France, secretary and councilor of state, and member of the privy council in charge of foreign affairs. Frederick the Great styled B. the "Oracle of Denmark." Struensee put him out of office in 1770, but he was recalled two years later, just before his death.

BE'RÖE, a genus of *acalephæ* (q.v.), of a division distinguished as *ciliogradæ*, i.e., moving by means of *cilia* (q.v.), very different from the medusæ, and of higher organization. This genus is now the type of a family characterized by a nearly globular or oval body, of a delicate jelly-like substance, with an alimentary canal passing through its axis, which is vertical as the animal floats in the water; the body strengthened by bands of somewhat firmer texture, "which run like meridian lines from pole to pole." These bands are covered with rows of large cilia, the motion of which is extremely rapid, and is evidently controlled by the will of the animal, so that it swims with rapidity, and easily changes its course. The motion of the cilia causes a beautiful iridescence: the animals also are phosphorescent by night. *B.* (or *cydippe*) *pileus* (figured in the article ACALEPHÆ) is a beautiful little creature, very abundant in the sea on many parts of the British coasts. It is provided with two very long and slender tentacula, which proceed from the sides of the body, and are covered with a great number of still finer filaments. These organs are probably employed for seizing food. This, and other kinds of B., form a great part of the food of whales.

BERŒ'A, or BERE'A, a city of ancient Macedonia, at the foot of Mt. Bermius, visited by St. Paul, who preached there. The modern Veria, 35 m. w. of Salonica, is on or near the site of Berœa.

BERO'SUS, an educated priest of Babylon, who had a knowledge of the Greek language, and probably lived about 260 B.C. He wrote, in Greek, three books of Babylonian-Chaldean history, in which he made use of the oldest temple archives of Babylon. The work was highly esteemed by Greek and Roman historians, but unfortunately only a few fragments have been preserved by Josephus, Eusebius, Syncellus, and others. Even these fragments are of great value, as they relate to the most obscure portions of Asiatic history. They have been edited by Richter in his *Berosi Chaldæorum Historiæ quæ supersunt*, 1825. The *Antiquitatum Libri Quinque cum Commentariis Joannis Annii*, first published in Latin by Eucharius Silber (Rome, 1498) as a work of B., and often republished, was the pseudonymous work of the Dominican, Giovanni Nanni of Viterbo.

BERRE, ETANG DE, an extensive lagoon of France, department Bouches-du-Rhône, with large salt-works and eel-fisheries. It discharges its surplus waters into the sea by the Port-du-Bouc.

BERRIEN, a co. in Georgia, on the Alapaha and Little rivers; intersected by the Brunswick and Albany railroad; 750 sq.m.; pop. '80, 6,619—803 colored. Surface level, with much woodland. It produces corn, rice, cotton, etc. Co. seat, Nashville.

BERRIEN, a co. in s.w. Michigan, bordering on Indiana; intersected by the Chicago and Michigan, the Lake Shore, and the Michigan Central railroads; 600 sq.m.; pop. '80, 36,780; drained by the Pawpaw and St. Joseph's rivers. The surface is nearly level; the soil a deep loam, bearing forests of hard timber. Productions entirely agricultural. Co. seat, Berrien Springs.

BERRIEN, JOHN MACPHERSON, 1781–1856; b. N. J.; a lawyer, solicitor, and afterwards judge of the eastern district of Georgia; member of the Georgia legislature and of the U. S. senate; attorney-general in Jackson's first cabinet; elected again to the senate in 1840, and in 1846.

BERRY, *Baccа*, the term employed in botany to designate a description of fruit more or less fleshy and juicy, and not opening when ripe. The inner layers of the pericarp (q.v.) are of a fleshy or succulent texture, sometimes even consisting of mere cells filled with juice, whilst the outer layers are harder, and sometimes even woody. The seeds are immersed in the pulp. A B. may be one-celled, or it may be divided into a number of cells or compartments, which, however, are united together not merely in the axis, but from the axis to the rind. It is a very common description of fruit, and is found in many different natural families, and both of exogenous and endogenous plants. As examples, may be mentioned the fruits of the gooseberry, currant, vine, barberry, bilberry, belladonna, arum, bryony, and asparagus, which, although agreeing in their structure, possess widely different properties. Some of them, which are regarded as more strictly berries, have the calyx adherent to the ovary, and the placentas—from which the seeds derive their nourishment—parietal, that is, connected with the rind, as the gooseberry and currant; others, as the grape, have the ovary free, and the placentas in the center of the fruit.—The orange and other fruits of the same family, having a thick rind dotted with numerous oil-glands, and quite distinct from the pulp of the fruit, receive the name *hesperidium;* the fruit of the pomegranate, which is very peculiar in the man-

ner of its division into cells, is also sometimes distinguished from berries of the ordinary structure by the name *balausta*. See POMEGRANATE. Fruits like that of the water-lily, which at first contain a juicy pulp, and afterwards, when ripe, are filled with a dry pith, are sometimes designated *berry-capsules*. The gourds, also, which at first have 3 to 5 compartments, but when ripe, generally consist of only one compartment, are distinctively designated by the term *pepo*, *peponium*, or *peponida*, to which, however, *gourd* may be considered equivalent.

BERRY, or BERRI, one of the old French provinces (now forming the departments of Indre and Cher (q.v.), in lat. 46° 10′ to 47° 40′ n., and long. 1 to 3° e., its greatest length being about 100 m., and its greatest breadth 90. Having come into the possession of the French crown, it gave title at various times to French princes, the younger son of Charles X. being the last who held it.

BERRY, CHARLES FERDINAND, Duke de, second son of the count of Artois (afterwards Charles X.) and of Maria Theresa of Savoy, was born at Versailles, Jan. 24, 1778. In 1792, he fled with his father to Turin; fought with him under Condé against France; afterwards visited Russia, and lived for some time in London and Edinburgh. In 1814 he returned to France, and the following year was appointed by Louis XVIII. commander of the troops in and around Paris. In 1816, he married Caroline Ferdinande Louise, eldest daughter of Francis, afterwards king of the Two Sicilies. On this marriage the continuance of the elder Bourbon line depended. The duke de B. was assassinated on the 13th Feb., 1820, as he was conducting his wife from the opera-house to her carriage, by a person named Louvel. He left only one daughter, Louise-Marie-Thérèse d'Artois, mademoiselle de France, born 1819; but on the 29th Sept., 1820, the widowed duchess gave birth to the prince, Henry, duke of Bordeaux, afterwards styled count of Chambord. After the July revolution, 1830, in which the duchess exhibited immense force of character and courage, offering herself to lead on the troops against the insurgents, she, with her son, followed Charles X. to Holyrood, but left a considerable party in France in favor of the pretensions of her son as Henry V. of France. During a visit to Italy, the duchess was so far encouraged in her ambition, that a project was formed for reinstating the Bourbons in France; and, accompanied by several friends, she landed near Marseilles, April 29, 1832. After many adventures, she was betrayed, and was imprisoned in the citadel of Blaye. The confession of the duchess, that she had formed a second marriage with the Neapolitan marquis, Lucchesi-Palli, destroyed at once her political importance, and the government set her at liberty. She died in 1870.

BERRYER, PIERRE ANTOINE, a distinguished French advocate and party politician, was born in Paris, 4th Jan., 1790, and first distinguished himself by his defense of victims of the restoration. In 1829, he was chosen deputy, and ever afterwards steadily represented the rights and policy of the elder Bourbons. His legitimist tendencies kept him for a time in the political background under Louis Philippe; but as the legitimist party in the chamber increased, his position grew in importance. He repeatedly undertook the defense of persons prosecuted by the government, not only of his own party, but republican leaders. It was he who defended Louis Napoleon in the chamber of peers after the Boulogne *attentat*. With the elder Bourbons he was in constant communication, and was one of the heads of the legitimist party who made a pilgrimage to the count of Chambord in London, in 1843. After the revolution of 1848, he represented the Bouches-du-Rhône: seemed inclined to support the government of the president, Louis Napoleon; and became a member of his privy-council. But this did not hinder him from going to Wiesbaden, in 1850, to do homage to the count of Chambord. On that occasion, he was openly spoken of as the future minister of Henry V. When Changarnier was removed from his command, B. united with Thiers and others to oppose the pretensions of the president, and he was one of the few who boldly protested against the *coup d'état*. In 1854, he was elected a member of the French academy. His inaugural speech contained some uncomplimentary allusions to the lower empire, and its publication was prohibited, the prohibition, however, being removed in 24 hours. B. added greatly to his reputation as an orator by his defense of Montalembert (q.v.) against the government prosecution in Nov., 1858. He died 29th Nov., 1868.

BERSAGLIE'RI is the name given to the riflemen or sharpshooters of the Italian army. After the disastrous campaign of Charles Albert against the Austrians in 1848–49, and the abdication of that monarch, his son, Victor Emmanuel, commenced a remodeling of the Sardinian army. One improvement, brought about by gen. Alessandro della Marmora, was the formation of a corps of bersaglieri. These were light active soldiers, dressed in a picturesque but serviceable dark-green uniform, and armed with long rifles. Two battalions of these riflemen formed part of the Sardinian army during the Crimean war. On the 16th of Aug., 1855, they took part in the battle of the Tchernaya. During the Italian war of 1859, the B. were engaged in many operations requiring dash and brilliancy. There are over 40,000 B. in the regular army.

BER'SERKER (*ber*, bare, and *serkr*, shirt of mail), a redoubtable hero in Scandinavian mythology, the grandson of the eight handed Starkader and the beautiful Alfhilde. He despised mail and helmet, and, contrary to the custom of those times, went always into battle unharnessed, his fury serving him instead of defensive armor. By the daughter

of King Swafurlam, whom he had slain in battle, he had twelve sons, who inherited the name of B., along with his warlike fury.

BER'SERKER (*bare serk*, or only in a shirt; i.e., without mail), a class of combatants among the early Norse people whose love of fighting led them to a fury of madness. They were so wild that chains could hardly restrain them. Friend or foe, bare breast or buckler, stick or stone, dead or living, all were the same to the berserker when the fit was on, and he wandered aimlessly forth, "running an Indian muck at all he met." In later times the title was given to companies of hard fighters who were retained as body guards or special champions of renowned leaders. These periodical fits of rage were called the "berserk's course." When under his mad influence, the B. was a raging wolf to his friends and an armed maniac to his enemies. In the *Ynglinga Saga* we read: "But his (Odin's) men rushed forward without mail, and were as mad as dogs and wolves, and bit upon their shields, and were as strong as bears or bulls. Men slew they, and neither fire nor iron laid hold upon them."

BERTH, or BIRTH, in nautical language, is nearly equivalent to *room* or *space*. A ship's B. is the space which she occupies when at anchor, including a small breadth of sea all around her. The same name is also given to a messing or sleeping room on board ship, in a sense not very different from that of the word *cabin*. To "B." a ship's crew, is to allot to each man the place where his hammock, etc., are to be placed. In the third-class cabins of passenger-steamers, where many sleep in one room without partitions or divisions, each one's crib or bed-place is his berth.

BERTHA, the name of several famous women of the middle ages, half-historical, half-fabulous (see BERCHTA). ST. BERTHA, whose day is kept on the 4th July, was the beautiful and pious daughter of Charibert, king of the Franks, who having married (560 A.D.) Æthelbert, king of Kent, became the means of his conversion, and of the spread of Christianity among the Anglo-Saxons. In the romances of the Charlemagne cycle, there figures a BERTHA, called also Berthrada with the big foot, as the daughter of count Charibert of Laon, wife of Pepin the little, and mother of Charlemagne. In the romances of the *Round Table*, again, BERTHA is the name of a sister of Charlemagne, who makes Milo d'Anglesis the father of Roland. Better known is BERTHA, daughter of Burkhard, duke of the Alemanni, and wife of Rudolf II., king of Burgundy beyond Jura, who, after Rudolf's death (937), acted as regent for her infant son, Konrad; afterwards married Hugo, king of Italy; and died towards the close of the 10th century. This queen had the character of an excellent housekeeper, and is represented on seals and other monuments of the time as sitting on her throne spinning.

BERTHIER, a co. in Canada, province of Quebec, on the St. Lawrence river, above lake St. Peter; fronting about 10 m. on the river and running back without definite bounds into the unexplored region below Hudson's bay; pop. '71, 19,804. Chief town, Berthier, 46 m. e. of Montreal.

BERTHIER, ALEXANDRE, Prince of Neuchatel and Wagram, and marshal of the French empire, was b. at Versailles, Nov. 20, 1753. His father, a military engineer, trained him for the army, which he entered in 1770, and fought with Lafayette in the American war of independence. At the outbreak of the French revolution, he was appointed maj.gen. of the national guard of Versailles, and rose to be a gen. of division, and chief of the staff in the army of Italy, 1795; and in 1798, in the absence of Bonaparte, entered the papal territory, and proclaimed the republic in Rome. He accompanied Napoleon to Egypt in the same year as chief of the staff, a post which he also held in all the subsequent campaigns. At the revolution of 18th Brumaire (1799), he became war minister, and (till 1808) as such signed many important treaties and truces. He always accompanied the emperor, and often rendered important services; for the part he took in the battle of Wagram, he received one of his many distinctions. B. was Napoleon's proxy in the marriage of Maria Louisa, at Vienna, 1810. In the campaigns of 1812, 1813, and 1814, he was constantly by the emperor's side, and acted both as chief of the staff and as quartermaster-general. It was only B.'s love of order, quick insight, and activity that could have superintended the movements of so many armies. Napoleon did him full justice on this score, asserting at the same time that he was incapable of leading the smallest *corps d'armée* alone.

On the fall of Napoleon, B. hardly showed due gratitude for the favors heaped upon him. He had to surrender the principality of Neuchatel; and not to lose more, he submitted to Louis XVIII., who made him a peer and marshal, with the title of captain of the guards. Napoleon, who never doubted his secret attachment, made overtures to him from Elba: these he neither answered nor yet revealed to Louis, which made him suspected by both. On the return of Napoleon from Elba, in a fit of irresolution B. retired to Bamberg, in Bavaria, to his father-in-law, duke William, where his mind became unhinged with the conflict. On 1st July, 1815, while looking from the balcony of the palace at a division of Russian troops marching towards the French frontier, the bitter sight was too much—he threw himself down into the street, and thus ended his life. His *Mémoires* appeared in 1826.—He had two brothers, Victor Leopold, and Cæsar, who both served with distinction, and rose to be generals.

BERTHOLD OF RATISBON, about 1215–72; a Franciscan friar and famous outdoor preacher, working in Switzerland and Germany. His sermons have been published in modern German.

BERTHOLLET, Count CLAUDE LOUIS, one of the most distinguished theoretical chemists of his time, was b. at Talloire, a village of Savoy, near Annecy, on the 9th Dec., 1748. He studied at the university of Turin, and obtained a medical degree there in 1768. He afterwards went to Paris, where he was appointed physician to the duke of Orleans. He now applied himself with great assiduity to chemistry; in 1781, he was elected a member of the academy of sciences, and, some time after, the government made him superintendent of dyeing processes. In this situation he published a very valuable work on dyeing. In 1785, he announced his adherence to the antiphlogistic doctrines of Lavoisier, with the exception that he did not admit oxygen to be the acidifying principle, and herein he has proved to be right. In the same year, he published a paper on "dephlogisticated marine acid"—now called chlorine—pointing out its use for bleaching purposes; and following up the experiments of Priestley, he showed ammonia to be a compound of three volumes of hydrogen gas, and one volume of azotic gas. During the early part of the French revolution, B. traveled through the country, giving instruction as to the best means of extracting and purifying saltpeter to be used in the manufacture of gunpowder, and also as to the process of smelting and converting iron into steel. His joining the expedition of Napoleon to Egypt led to the formation of the institute of Cairo. On his return from Egypt, he was made a senator by Bonaparte, who also conferred on him several marks of honor, and made him a count. Notwithstanding, he voted for the deposition of Napoleon in 1814. On the restoration of the Bourbons, he was made a peer; but all his honors never made him other than a simple and unassuming gentleman. Besides the additions to chemical knowledge already mentioned, he, in conjunction with Lavoisier, and two other chemists, promulgated a new chemical nomenclature which has proved valuable to science. He died at Paris, 7th Nov., 1822.

BERTHOLLE'TIA. See BRAZIL NUTS.

BERTIE, a co. in North Carolina, on Albemarle sound, between the Chowan and Roanoke rivers; 900 sq.m.; pop. '70, 12,950—7437 colored. Level and fertile, producing corn, sweet potatoes, cotton, etc. Co. seat, Windsor.

BERTINO'RO, a t. of Italy, in the province of Forli, formerly belonging to the Papal states, six m. s.e. from Forli, pleasantly situated on a hill, the slopes of which are famous for their wines. At the foot of the hill, to the w., flows the Ronco. B. is the seat of a bishop, and has a cathedral, three other churches, and five convents. It was one of the ancient fiefs of the Malatesta, by whom it was given to the church. Pop. of commune 6388.

BERTIN, LOUIS FRANÇOIS, called Bertin l'Ainé, an eminent French journalist, was b. in Paris, 1766. He began writing for the press in 1793, and in 1799 set on foot the *Journal des Débats* (q.v.). B.'s royalist principles offended the government of Napoleon, and cost him imprisonment and banishment to Elba; whence, however, he escaped to Rome, where he formed a friendship with Châteaubriand. In 1804, he returned to Paris, and resumed the editorship of the *Débats*, but was much hampered by Napoleon, who imposed on the paper the title of *Journal de l'Empire*, and by subjecting it to police revision, gave it almost an official character. When B., in 1814, became free to follow his own bent, the journal reverted to its royalist principles. During the Hundred Days, it fell into other hands, till the return of the Bourbons restored it once more to B., who, in the meantime, had taken part in the *Moniteur de Gand*. Throughout the restoration, B. gave almost constant support to the ministerial party. Though he did not join in the protest of the liberal journals against the *ordonnances*, he gave his adhesion to the July monarchy, and continued faithfully to support it. He continued to edit the *Débats* till his death, 13th Sept., 1841.

BERTIN, LOUIS MARIE ARMAND, son of the former, was b. in Paris, 1801, and became, after the restoration, secretary to Châteaubriand during his embassy in England. In 1820, he joined the editorial staff of the *Journal des Débats*, and at his father's death assumed the chief direction. As a journalist, he contrived, as well as his father, to maintain a certain independence of the government. B. died at Paris, Jan. 11, 1854.

BERTRAND DE BORN. See BORN.

BERTRAND, HENRY GRATIEN, Count, one of Napoleon's generals, known for his faithful attachment to the emperor through all his fortunes, was b. at Châteauroux, 1773, and early entered the armies of the revolution as engineer. He accompanied the expedition to Egypt, and directed the fortification of Alexandria. Returning with the rank of gen. of brigade, he distinguished himself at Austerlitz, and became the emperor's adjutant; and after the battle of Aspern, in 1809, for establishing bridges over the Danube, he was created count and governor of Illyria. After sharing with credit in the subsequent campaigns, he retired with the emperor to Elba, was his confidant in carrying out his return to France, and finally shared his banishment to St. Helena. On Napoleon's death, B. returned to France, where, though sentence of death had been pronounced upon him—a sentence which Louis XVIII. had wisely recalled—he was restored to all his dignities, and, in 1830, appointed commandant of the polytechnic school. He

formed part of the expedition which, in 1840, brought back the remains of Napoleon to France. His death took place at Châteauroux, 31st Jan., 1844.

BERVIC, CHARLES CLEMENT BALVAY, a celebrated French engraver, was b. at Paris in May, 1756. In 1790, he made himself famous by a full-length engraving of Louis XVI., from the picture by Callet, one of the finest works of the kind ever produced. The engravings of the Laocoon, Regnault's "Education of Achilles," and Guido's "Rape of Deianira," also from B.'s graver, display equal beauty of manipulation, and fully higher power. B. died Mar. 23, 1822.

BERWICK, JAMES FITZ-JAMES, Duke of, was the natural son of James II., by Arabella Churchill, sister of the duke of Marlborough. He was b. in 1670, in France, where he was educated, and entered the army. After serving in Hungary under Charles of Lorraine, he returned to England shortly before the revolution of 1688, which he exerted himself to prevent. In 1689, he accompanied his father in his Irish expedition, and after the death of St. Ruth, had the nominal chief command. He next served in Flanders, under marshal Luxembourg, and afterwards under the duke of Burgundy and marshal Villeroi. In 1706, he was created a marshal of France, and sent at the head of an army to Spain, where he established the throne of Philip V. by the decisive victory of Almanza. For this important service, he was made a grandee of Spain, under the title of duke of Liria and Xerica. After several years of inactivity, he received the command, in 1734, of an army intended to cross the Rhine. While besieging Philipsburg, he was killed by a cannon-ball. Contemporary testimony, confirmed by his military conduct, shows B. to have possessed some of the best qualities of a great commander. His defensive campaign in 1709, in Provence and Dauphiné, against the superior force of the duke of Savoy, has always been regarded as a triumph of strategic skill. He was twice married. His son by the first marriage succeeded to the dukedom of Liria; his dukedom (De Fitz-james) and estates in France passed to his children by the second marriage.

BERWICK, NORTH, a seaport t. in Haddingtonshire, at the entrance to the firth of Forth, 19 m. e.n.e. of Edinburgh. Formerly a fishing-village, N. B. has now become a fashionable watering-place. It unites with Lauder, Dunbar, Jedburgh, and Haddington, in returning one member to parliament. Pop. (1871) of burgh, 1408; of parish, 2373. The parish includes the Bass Rock, North Berwick Law, and the ruins of Tantallon castle. The castle is graphically described in Scott's *Marmion*. It is an irregular pile, 2 m. e. of the t., on a high rock, surrounded by the sea on three sides, with a ditch on the land-side, where there was formerly a draw-bridge. It was a stronghold of the Douglas family. N. Berwick Law is a conical hill of an elevation of 940 ft., on the s., close to the town.

BERWICK-ON-TWEED, a seaport t. at the mouth of the Tweed, 58 m. s.s.e. from Edinburgh. It is the frontier town of England and Scotland, and with its liberties, comprising an area of about 8 m., forms an independent borough and county by itself separate from England and Scotland; and since the municipal reform act of 1835, its proper designation is "county of the borough and town of Berwick-upon-Tweed." It has its own quarter sessions and recorder, its own magistrates and petty sessions, and maintains its own police staff. The municipal and parliamentary boroughs are co-extensive. Pop. '71, 13,283, an increase since 1861 of 17; inhabited houses, 2092, increase, 209; constituency, 1148, returning two members of parliament. The past history of B. is full of interest, especially in regard to the border wars. The authentic records of B. begin in the reign of Alexander I., 12th c., when it was one of the principal seaports in the kingdom. B. finally passed into the possession of England in 1482. The town has an antiquated and somewhat decaying appearance. It is girded with old fortifications, and has large barracks. Tweedmouth and Spittal (the latter a favorite watering-place), on the s. side of the Tweed, both within the municipality of B., are reached by an old stone bridge, and a magnificent viaduct of 28 arches spans the river, and connects the North-eastern with the North British railway. The shipping belonging to the port in 1875 was 25, tonnage, 1459, besides 576 fishing-boats. The harbor commissioners resolved, with a view of resuscitating the trade of the port, to construct a wet dock, at a cost of £40,000; this undertaking, commenced in 1873, is now completed. Of recent years the salmon fishings have improved, but the herring fishing has declined. For the manufacture of agricultural implements B. stands high, and in Spittal there are several large artificial-manure works. It has 20 places of worship, 4 belonging to church of England, 3 to church of Scotland, 4 Eng. Presbyterian, 4 U. P., and 5 of other denominations; 14 day-schools, including corporation's academy. Public institutions include infirmary and dispensary, museum, literary institute, and subscription library. Besides several new ecclesiastical edifices and schools erected of late years, a freemasons' hall, a good templars' hall, and a mission hall were built in 1873.

BERWICKSHIRE, a maritime and border co. in the s.e. extremity of Scotland, is bounded n. by Haddington; s. and s.e. by Roxburgh and Northumberland, having a detached portion of Durham on its s.e. limits; e. by the German ocean and Berwick-on-Tweed; and w. by Mid-Lothian and Roxburgh. It extends from e. to w. 35 m., from n. to s. 22 m., and has an area of 464 sq.m., or 297,161 statute acres. B. is divided into

three districts—the Merse, the Lammermoors, and Lauderdale. The largest and most fertile district is the luxuriant valley of the Merse, believed to be the most extensive and richest piece of level land in Scotland, extending to nearly 130,000 acres. The Lammermoors, consisting of 90,000 acres, chiefly pastoral, divide the valley of the Tweed from Mid-Lothian and Haddington. Lauderdale, in extent about 67,000 acres, comprising a mixture of hill and dale, runs along the banks of the Leader Water. From its commencement at Lamberton to St. Abb's head, the coast line of B. extends to 8¼ miles, or allowing for headlands, 9¼. The coast is rocky and bold, with only two bays, at Eyemouth and Coldingham respectively. Geologically, as well as topographically, B. possesses numerous interesting features—the Lammermoors (the principal summits of which are Lammer Law, Crib Law, Sayer's Law, and Clint hill, ranging from 1500 to 1600 ft. high), consist of Silurian strata, stretching to St. Abb's head; in the s., carboniferous rocks are found, while an extensive bed of red sandstone extends easterly from the center of the county to the sea-coast. On the coast porphyry is found, and some traps and syenite in the interior. Ironstone and thin seams of coal occur, as well as gypsum, clay, and shell-marl. The Blackadder, Whitadder, and Leader streams, the river Eye being the only exception, are tributaries of the Tweed. Pop. '71, 36,486; parishes, 31; inhabited houses, 6491; constituency (1878), 1757; 55 day-schools, with 5833 scholars, under the jurisdiction of school-boards, and about 30 independent schools, attended by nearly 2000 children; 68 places of worship (32 established, 16 free, 17 U. P., and 3 of other denominations). B. returns one member to parliament. Agriculturally, B. occupies a prominent position, and the science of agriculture has in this county found great development. In 1875, 192,480 statute acres were farmed by 983 tenants or owners. B. is, however, almost entirely barren of hives of manufacturing industry. The principal towns are Dunse, the most populous, the birthplace of Thomas Boston, Dr. M'Crie, and, as some contend, of Duns Scotus; Greenlaw, the county town; Lauder, a royal burgh; Eyemouth, a prosperous fishing station; Coldstream, where gen. Monk first raised the Coldstream guards; Ayton; and Earlston, the Ercildoune of Thomas the Rhymer. Dunse being more central than Greenlaw, the great bulk of the county business has been transferred thither. Many names famous in Scottish annals are closely associated with B.; amongst others, ancestors of the royal Stuarts; the noble family of Douglas; the earl of Bothwell, who was sheriff of B.; the brave but unfortunate son of James II., styled duke of B.; the great Marlborough (baron Eyemouth); and the records of the court of session show that no fewer than 23 judges were natives of B. The antiquities of the county are few, the chief being the ruins of Dryburgh abbey, Coldingham priory, Fast castle, and the remains of British and Roman camps, and barrows.

BER'YL, a mineral which scarcely differs except in color from emerald (q.v.), never exhibiting the bright rich green which characterizes that gem, but colorless, yellowish, greenish-yellow, or blue. The finer varieties, which are transparent and of beautiful color, are distinguished as *precious B.*, and are sometimes called *aquamarine*. These occur in crystals similar in form to those of emerald; but the regular hexagonal prism is more frequently modified by truncation on the angles or edges, acumination, etc. The prisms are often long. Their sides are longitudinally striated, often deeply so; but the truncating or terminating planes are smooth. The coarser varieties of B. (*common B.*) are also found crystallized, but often massive. B. occurs chiefly in veins that traverse granite or gneiss, or imbedded in granite; sometimes it is found in alluvial soils formed from such rocks. Common B. is found in a number of places in Europe; Rubislaw, near Aberdeen, is a British locality. The mountains of Aberdeenshire, and those of Mourne in Ireland, yield precious B., which is also found in several parts of the continent of Europe and of New England, but principally in Brazil and Siberia. It is much valued as a precious stone, although not so much as the emerald.

BERZELI"S, Johann Jacob, Baron, one of the greatest of recent chemists, was b. at Westerlösa, in e. Gothland, Sweden, 20th Aug., 1779. While studying for the medical profession at the university of Upsala, he was more attracted by the preparatory natural sciences, especially chemistry. After being some time employed in medical practice and lecturing, he was appointed (1806) lecturer on chemistry in the military academy of Stockholm, and, in the following year, professor of medicine and pharmacy. He was shortly after chosen president of the Stockholm academy of sciences; and from 1818 till his death, 7th Aug., 1848, held the office of perpetual secretary. The king raised him to the rank of baron; other honors from learned societies were conferred on him; and the directors of the Swedish ironworks, in consideration of the value of his researches in their particular branch of industry, bestowed on him a pension for life. In 1838, he was made a senator; but he took little part in politics. The field of his activity lay in his laboratory, where he acquired a name of which his country is justly proud. His services to chemistry are too vast to be described here. The science of chemistry, as at present organized, rests in a great measure upon the discoveries and views of B., although in not a few points he has been controverted, or found wrong. His multiplied and accurate analyses established the laws of combination on an incontrovertible basis; and to him we owe the system of chemical symbols. He discovered the elements selenium and thorium, and first exhibited calcium, barium, strontium, columbium or tantalum, silicium, and zirconium, in the metallic form. The blowpipe in the hands of B. became a powerful

instrument in the analysis of inorganic substances. The multitude and accuracy of his researches in every branch of chemical inquiry make it difficult to conceive how one man could have accomplished so much. Of his numerous writings, the most important is his *Lärebok i Kemien* (text-book of chemistry, 3 vols., Stock. 1808–18), which has since passed through 5 large editions, on each occasion being almost wholly rewritten. The best known edition is that published in 8 vols. at Brussels in 1835. The book has been translated into every European language. His essay *On the Use of the Blowpipe* exhausts the subject, while his *Annual Reports on the Progress of Physics, Chemistry, and Mineralogy*, undertaken at the request of the academy of sciences in 1822, have proved very valuable to science. Scarcely less so have been the *Memoirs Relative to Physics, Chemistry, and Mineralogy*, of which he was one of the originators and conductors, and to which, during the 12 years they were published, from 1806 to 1818, he contributed 47 original papers.

BESANÇON (*Vesontio*), capital of the French department of Doubs, and formerly capital of Franche-Comté, is situated on the river Doubs, which divides it into two parts, about 45 m. e. of Dijon, Lat. 47° 14′ n., long. 6° 3′ east. It was strongly but irregularly fortified by Vauban, the citadel being considered impregnable. Since that time, the fortifications have been extended and strengthened, and B. is now considered one of the strongest military positions in Europe. It was the ancient Vesontio, Besontium or Visontium, and was a considerable place even in the time of Cæsar, who, in 58 B.C., expelled from Vesontio the Sequani, and, in the neighborhood of the city, gained a victory over Ariovistus. It then became an important Roman military station. In modern times, after undergoing many changes, it finally came into the possession of France in 1674. Several streets and places in B. still bear old Roman names; and in the neighborhood are found ruins of a triumphal arch of Aurelianus, an aqueduct, an amphitheater, and a theater which must have been large enough to contain 20,000 spectators. Among the modern structures, the cathedral and the churches of St. John and the Magdalen, with the prefecture and the half-Gothic, half-Roman palace of cardinal Granvella, are most remarkable. B. has considerable manufactures, chiefly watches (of which more than 300,000 are made annually), porcelain, carpets, iron-wire, and beer, and is an important entrepôt for the produce of part of Switzerland and the s. of France. 600,000 bottles of Seltzer-water are annually manufactured. Pop. '76, 42,808.

BESANTS', or **BEZANTS'**, circular pieces of bullion, generally gold, without any impression, supposed to represent the old coinage of Byzantium, brought home by the crusaders, and hence of frequent occurrence as heraldic charges. B. are generally introduced into the arms of banks, and also into those of individuals who have been specially connected with money. Similar figures, when not colored *or* (gold), or *argent* (silver), are known in heraldry by the general term of *roundels*. A *bezanty cross*, is a cross composed of B.; and *bezanty* or *bezantée*, is the term used when the shield, or any particular charge, is strewed with besants.

BESIEGING. See SIEGE.

BESSARA'BIA, a government in the s.w. of Russia, on the Roumanian frontier. The area, enlarged by the restoration in 1878 of the portion ceded to Moldavia in 1856, is about 18,000 sq.m.; the pop., now nearly 1,400,000, is composed of Russians, Poles, Wallachians, Moldavians, Bulgarians, Greeks, Armenians, Jews, Germans, and Tartars, with a sprinkling of gypsies. The Dniester flows along the whole of its northern and eastern boundaries; the Pruth separates it from Moldavia on the w.; and it has the Danube on the south. B. is also intersected by several considerable streams; which are, however, much reduced by the summer heats. The climate is, on the whole, mild and salubrious. In the n.w., the country is traversed by well-wooded offshoots of the Carpathian mountains. Generally, however, B. is flat and fertile, but for want of proper cultivation the land does not yield the rich returns it is capable of doing. Wheat, barley, and millet are raised to some extent, as well as hemp, flax, tobacco, fruit, and wine; but the breeding of cattle forms the chief business of the inhabitants. Salt, cattle, wool, and tallow are exported; leather, soap, and candles are manufactured. B., which fell under the power of the Turks in 1503, suffered heavily in all wars with Russia, and was ceded to Russia in 1812. By the treaty of Paris, the portions of B. lying along the Pruth and the Danube—about 4000 sq.m., with some 200,000 inhabitants—were assigned to Moldavia; at the Berlin congress of 1878, this region was again transferred to Russia.

BESSA'RION, JOHANNES, or BASILIUS, b. at Trebizond, on the Black sea, 1395, is remembered as one of the earliest of those scholars who, in the 15th c., transplanted Greek literature and philosophy into the west, and rescued the mind of Christendom from the trammels of scholasticism. B. imbibed his love of Plato's writings from his tutor, Gemistus Pletho. As bishop of Nicæa, B. accompanied the Greek emperor, John Palæologus, to Italy; and effected, at the council of Florence in 1439, a union between the Greek and the Romish churches, which, however, was of short duration. Soon afterwards he joined the Romish church, but always retained a glowing love of his native land. He was made cardinal by pope Eugene IV. in 1439. Ten years after, Nicholas V. created him cardinal-bishop of Sabina, and in the same year bishop of Frascati. For five years, also, he discharged the duties of papal legate at Bologna.

After the fall of Constantinople, B. visited Germany; and at the diets of Nuremberg, Worms, and Vienna, endeavored to promote a crusade against the Turks. In philosophy, he professed to be a follower of Plato, but without depreciation of Aristotle. His writings, consisting of Latin translations of Greek authors, defensive treatises on the Platonic philosophy, with discourses and letters, have never been published collectively. Twice he was nearly elected pope; but his partiality for the heathen philosophy was probably regarded as some disqualification by the sacred college. B. died at Ravenna, Nov. 19, 1472, leaving his collection of 600 valuable Greek MSS. to the St. Mark's library, Venice.

BESSÈGES, an industrious and thriving t. of France, in the n. of the dep. of Gard, 11 m. n. from Alais. It is situated on the river Ceze. A railway connects B. with Alais. There are extensive coal-mines in the neighborhood. Pop. '76, 7953.

BESSEL, FRIEDRICH WILHELM, one of the most distinguished of modern astronomers, was b. at Minden, July 22, 1784. In 1806, he was, on the recommendation of Olbers, whom he had greatly assisted by his remarkable expertness in calculation, appointed assistant to Schröter at Lilienthal. In 1810, he published his researches on the orbit of the great comet of 1807, which gained for him the Lalande prize of the Paris academy of sciences. In the same year he was appointed director of the new observatory to be erected by the king of Prussia at Königsberg; and repairing thither immediately, superintended the erection and the mounting of the instruments. The establishment was completed in three years. In 1818, B. published his *Fundamenta Astronomiæ* —giving the results of Bradley's Greenwich observations—a work upon which he had been engaged for eleven years. This work is one of the highest value to astronomers. It is described by a competent authority as having laid the foundations of the principal improvements which have been made in astronomy since the date of its publication. In 1830 appeared his *Tabulæ Regiomontanæ*, forming a kind of supplement to the above work. Besides numerous papers of an important character (nearly 200 in all) scattered through various scientific journals, he also published an inquiry on the *seconds' pendulum* for Berlin (1828, and again in 1837), *Astronomical Researches* (2 vols., Königsb. 1841–42). His paper on the precession of the equinoxes gained him the prize of the Berlin academy. After a series of three years' observations he succeeded in determining the annual parallax of the fixed star 61 Cygni (see STARS), an achievement honorable not only as the first of its kind, but for the marvelous skill and patience necessary for its accomplishment. In the years 1824–33, B. made a series of 75,011 observations in 536 sittings, and completed a catalogue of stars (extending to the ninth magnitude) within the zone from 15° n. to 15° s. declination. These were afterwards reduced by Weisse. In one of his lectures, delivered at Königsberg in 1840, B. indicated the existence of the new planet afterwards discovered by Le Verrier, and named Neptune; and but for the death of a favorite son, he in all probability would have undertaken the investigation of the problem. B.'s *Popular Lectures on Astronomy*, given at Königsberg, 1832–44, were edited by his friend Schumacher, and published at Hamburg in 1848, two years after his death, which took place Mar. 7, 1846. All scientific associations, both on the continent and in England, were eager to confer honor on themselves by enrolling B. as one of their members. He was a thoroughly practical man of science, never allowing himself to be carried away by any theory, however inviting, and particularly remarkable for the precision of his calculations, being satisfied with nothing less than perfect exactness.

BESSEMER, HENRY, b. England, 1813; an engineer, and inventor of many machines and improvements, particularly in reference to the manufacture and use of the metal known as Bessemer steel. (See BESSEMER PROCESS, *ante.*) One of his latest inventions is the "Bessemer saloon" for the avoidance of sea-sickness, which proved to be a failure. Prizes and other honors have been conferred on B. by a number of governments and societies.

BESSEMER PROCESS FOR MAKING STEEL. The boldest and most noted attempt which has yet been made to improve on the older methods of making both malleable iron and steel, is that of Mr. Henry Bessemer, whose process was patented in 1856. Bessemer's first idea was to blow air through molten cast-iron till the whole of the carbon was oxidized when malleable iron was required, and to stop the blowing when a sufficient degree of decarburization was effected in order to produce steel. He has hitherto failed to produce malleable iron of the least service by his process, so that, as a metallurgical operation, it is at present confined to the manufacture of steel. But neither can serviceable steel be made by the plan first specified by Bessemer, except from the best charcoal iron, such as the Swedish. In England, where charcoal iron is not used for this purpose, the process can only be successfully conducted by first oxidizing the whole of the carbon and silicon, and then restoring the proper amount of carbon by the addition of a small quantity of a peculiar cast-iron of known composition, called *spiegeleisen*. Moreover, hematite pig is the only kind of English iron which can be employed, as that made from clay iron-stone contains too much phosphorus and sulphur. The getting rid of these two elements and silicon is the most formidable difficulty which the steel-manufacturer has to encounter.

The various steps in the Bessemer process, as at present conducted, are as follows: Pig-iron is melted either in a cupola or reverberatory furnace, and run in the liquid state into a converting vessel. This converter, or "kettle," as it is called in Sheffield, is of wrought-iron, lined either with fire-brick or with a siliceous material called "ganister," and is suspended on trunnions, so as to admit of its being turned from an upright to a horizontal position by means of hydraulic apparatus. The capacity of a converter varies from three to ten tons. In the bottom there are seven tuyères, each with seven holes of one half inch in diameter, through which atmospheric air is blown with a pressure of 15 to 20 lbs. per sq. inch by a blowing-engine. The molten iron in the converter is therefore resting, from the first, on a bed of air, the strength of the blast being sufficient to keep it from falling through the tuyères into the blast way. During the blowing off of the carbon at this stage, a striking and magnificent effect is produced by the roar of the blast, and the volcano-like shower of sparks and red-hot fragments from the mouth of the converter, as well as by the dazzling splendor of the flame. In about 15 or 20 minutes, the whole of the carbon is dissipated. The first "blow" being over, the converter is lowered to a horizontal position, and presently a red stream of molten spiegeleisen is run into its mouth, till it amounts to from 5 to 10 per cent of the whole charge. As already stated, the spiegeleisen restores the proper amount of carbon to produce steel; and after it is added, the blast is again turned on for a few minutes to secure its thorough incorporation. There is a circular pit in front of every two converters, with a hydraulic piston in its center, and on its counterpoised arm a large ladle is hung, so that it can sweep the whole circumference. Round this the ingot molds are arranged, and the hydraulic machinery is so conveniently planned that, simply by moving levers, a man standing on a small platform can empty the contents of the huge converters into the ladle, raise or lower the ladle itself, and turn it round from point to point, so as to fill the molds by means of a plug in its bottom. Steel made in this way is not sufficiently dense, and accordingly the molds are lifted off the ingots by means of a hydraulic crane, and the latter removed while still hot, and condensed under heavy steam-hammers. After this, they are rolled into rails, tires, plates, and other heavy objects, for which this steel is suitable. Although, as already said, Bessemer steel will not do for tools and cutting instruments, nor even for such comparatively coarse objects as the springs of railway wagons, yet the great value of the invention is unmistakably shown by the fact that 500,000 tons of steel are now annually made by this process in Great Britain, the total number of converting vessels in use being 91, and their aggregate capacity 467 tons. Large quantities are also manufactured by it in Sweden, Russia, Austria, Prussia, Belgium, and France. It is likewise extensively employed in America. In an experimental trial, said to be quite fairly conducted, a Bessemer steel rail lasted fully longer than 20 iron ones. See IRON.

BESSEMER STEEL. (BESSEMER PROCESS FOR MAKING STEEL, *ante.*) The product of Bessemer steel in the United States, in 1879, was 829,429 gross tons; in England, in the same year, 834,711 tons. In this manufacture the English used 66 converters, the Americans 22. The capacity of American mills for the production of this metal may be learned from the following table:

BESSEMER STEEL MILLS IN THE UNITED STATES, Jan. 1, 1880.

NAME.	PLACE.	WHEN OPENED.	CONVERTERS.	
			No.	Tons.
Albany and Rensselaer Iron and Steel Co	Troy, N. Y.	Feb., 1865.	2	7
Pennsylvania Steel Works	Baldwin Sta., Pa.	June, 1867.	2	6½
Cleveland Rolling Mills	Cleveland, O.	Oct., 1868.	2	6
Cambria Iron Co	Johnstown, Pa.	July, 1871.	2	5
Union Rolling Mills	Chicago, Ill.	July, 1871.	2	6
North Chicago Rolling Mills	Chicago, Ill.	April, 1872.	2	6
Joliet Iron and Steel Works	Joliet, Ill.	March, 1873.	2	6¾
Bethlehem Steel Works	Bethlehem, Pa.	Oct., 1873.	2	7
Edgar Thompson Steel Works	Pittsburg, Pa.	Sept., 1875.	2	7
Lackawanna Steel Works	Scranton, Pa.	Oct., 1875.	2	5
Vulcan Steel Works	St. Louis, Mo.	Sept., 1876.	2	7

Total number of mills, 11; of converters, 22; capacity of converters, 69½ tons.

BESSENO'VA, a small t. of the Austrian empire, in s. Hungary, on the n. bank of the Aranka, 8 m. w.s.w. from St. Miklos. Pop. 7896.

BESSIÈRES, JEAN BAPTISTE, Duke of Istria, and marshal of the French empire, was born at Preissac, in the department of Lot, Aug., 1768. After serving for a short time in the constitutional guard of Louis XVI., in Nov., 1792, he entered the army of the Pyrenees as a private soldier. In less than two years, he had attained the rank of captain, and passing into the army of Italy, he distinguished himself greatly in the battles of Roveredo and Rivoli. Having been made chief of a brigade in 1798, he in that year accompanied Bonaparte to Egypt, and made himself conspicuous at the siege of St. Jean

d'Acre, and at the battle of Aboukir. Afterwards he took a prominent part in the battles of Marengo, Olmütz, Austerlitz, Jena, Friedland, and Eylau; and within five years (from 1800 to 1805), he was made successively general of brigade, general of division, and marshal of France. For his gallant behavior in Spain, he was, in 1809, created duke of Istria. In the Russian campaign, he commanded the cavalry of the guard, and during the disastrous retreat from Moscow, the services he rendered were of the utmost importance. In 1813, he received the command of the whole of the French cavalry. On the morning of the battle of Lützen, while leading on foot the *tirailleurs* to reconnoiter the field from the defile of Rippach, he fell mortally wounded by a bullet. The news of his death was kept concealed from the army throughout the day. Bonaparte lost in B. one of his ablest officers, and his most faithful friend.

BESTIAIRES (Fr.), the name given to a class of written books of great popularity in the middle ages, describing all the animals of creation, real or fabled, and generally illustrated by drawings. They were most in fashion during the 11th, 12th, and 13th centuries. They served as encyclopædias of the zoology of those ages, but they had also another use. The symbolism which was then so much in vogue fastened spiritual meanings upon the several animals, until every quality of good or evil in the soul of man had its type in the brute world. It is in this way to the *B.* that we must look for explanation of the strange, grotesque creatures which are found sculptured on the churches and other buildings of the middle ages. There were B. both in prose and in verse, in Latin and in the vernacular. A few sentences from *Le Bestiaire Divin de Guillaume, Clerc de Normandie, Trouvère du XIII^e Siècle* (Caen, 1852), may help to give some notion of the class of works of which it is a fair example. "The unicorn," he writes, "has but one horn in the middle of its forehead. It is the only animal that ventures to attack the elephant; and so sharp is the nail of its foot, that with one blow it rips up the belly of that most terrible of all beasts. The hunters can catch the unicorn only by placing a young virgin in the forest which it haunts. No sooner does this marvelous animal descry the damsel, than it runs towards her, lies down at her feet, and so suffers itself to be taken by the hunters. The unicorn represents our Lord Jesus Christ, who, taking our humanity upon him in the virgin's womb, was betrayed by the wicked Jews, and delivered into the hands of Pilate. Its one horn signifies the gospel truth, that Christ is one with the Father," etc.

BESTUSCHEW, ALEXANDER, a Russian novelist, born about 1795, was captain in a dragoon regiment, and adjutant to Alexander, duke of Würtemberg. Having been involved with his friend Rylejew in the conspiracy of 1825, he was degraded to the ranks, and exiled to Yakutzk, but after long entreaty, permitted to enter the army of the Caucasus as a private in 1830. In June, 1837, he fell in a skirmish with the as yet unconquered mountaineers. Two years before his exile he, together with his friend Rylejew, who was executed in 1825, had published the first Russian almanac, *The Pole Star.* His later works, consisting chiefly of novels and sketches, written under the name of Cossack Marlinski, bore the impress of his own life and adventures in the Caucasus. They excel in depicting the wilder aspects of nature, and the excitements of a soldier's life, but fail in the delineation of character, and are often exaggerated, and sometimes absurd. His principal works are the tale of *Mullah Nur,* and the romance of *Ammalath Beg,* which last relates the treachery of a Circassian chief, and gives interesting pictures of the scenery of the Caucasus. Several of his novels were translated into German by Seebach (Leipsic, 1837), and his collective works appeared at St. Petersburg in 1840, under the name of *Marlinski's Tales.* His three brothers were implicated in the military conspiracy of 1825, and hanged by the special order of the emperor.

BETANZOS (anciently *Brigantium Flavium*), a t. of Spain, province of Corunna, 10 m. s.e. of the city of the same name. Ancient granite gateways still defend its narrow streets. It has manufactures of linen, leather, and earthenware. Pop. between 4000 and 5000.

BE'TEL, BE'TLE, or PAWN, a narcotic stimulant much used in the east, and particularly by all the tribes of the Malay race. It consists of a leaf of one or other of certain species of pepper, to which the name of betel-pepper is indiscriminately applied, plucked green, spread over with moistened quicklime (*chunam*) generally procured by calcination of shells, and wrapped around a few scrapings of the areca nut (see ARECA), sometimes called the betel-nut, and also known as *pinang.* This is put into the mouth and chewed. It causes giddiness in persons unaccustomed to it, excoriates the mouth, and deadens for a time the sense of taste. It is so burning that Europeans do not readily become habituated to it, but the consumption in the East Indies is prodigious. Men and women, young and old, indulge in it from morning to night. The use of it is so general as to have become a matter of etiquette; a Malay scarcely goes out without his betel-box, which one presents to another as Europeans do their snuff-boxes. The chewing of B. is a practice of great antiquity, and can certainly be traced back to at least the 5th c. B.C. It gives a red color to the saliva, so that the lips and teeth appear covered with blood; the lips and teeth are also blackened by its habitual use, and the teeth are destroyed, so that men of twenty-five years of age are often quite toothless. Whether the use of B. is to be regarded as having any advantages except the mere pleasure afforded to those who have acquired the habit of it, to counterbalance its obvious disad-

vantages, is a question upon which difference of opinion subsists. Some have represented it as beneficially promoting the secretion of saliva, strengthening the digestive powers, and warding off the attacks of fever; whilst others pronounce against it an unqualified condemnation. Sir James Emerson Tennent, in his valuable and interesting work on Ceylon, expresses the opinion that it is advantageous to a people of whose ordinary food flesh forms no part, and that it is at once the antacid, the tonic, and the carminative which they require.

The name B. is often given to the species of pepper of which the leaves are ordinarily chewed in the manner just described, which are also called B. PEPPER or PAWN. Some of them are very extensively cultivated, particularly *chevica betle*, *C. siraboa*, and *C. malamiri*, climbing shrubs with leathery leaves, which are heart-shaped in the first and second of these species, and oblong in the third. They are trained to poles, trellises, or the stems of palms, and require much heat with moisture and shade; upon which account, in the n. of India, where the climate would not otherwise be suitable, they are cultivated with great attention in low sheds, poles being placed for their support at a few feet apart. Hooker mentions, in his *Himalayan Journal*, that these sheds are much infested by dangerous snakes, and that lives are therefore not unfrequently lost in the cultivation of betel.—The genus *chevica* is one of those into which the old genus *piper* (see PEPPER) has recently been divided. The requisite qualities of B. are probably found in the leaves of numerous species not only of this but of other genera of the same family. The leaf of the ava (q.v.) is sometimes used.

BETH (*Heb.* "house"), used in the Old Testament as a part of the name of places, as "Beth-el," house of God; "Beth-aram," house of the height; "Beth-esda," house of mercy, etc.

BETHANY, a village in West Virginia, 10 m. e. of Wheeling. Bethany college was founded in 1841 by Rev. Alexander Campbell, the head of the sect of Baptists calling themselves "Disciples of Christ," and by the world at large known as "Campbellites." At last report the college has six professors and instructors and 105 students; W. K. Pendleton, LL.D., is the president.

BETHANY, meaning a "boat-house;" called "Lazariyeh," or "town of Lazarus," by the natives of Palestine, in reference to the event narrated in Scripture. It is a retired spot, beautifully situated on the southern slope of the Mt. of Olives, 3 m. from Jerusalem, with a pop. of about 500, principally Latins. There is nothing remarkable about the village except some ruins, among which are some which are said to have been the house of Martha and Mary, and the cave or grave of Lazarus, the descent into which is effected by 26 steps cut in the solid rock, leading to a small chamber, about 5 ft. square, also excavated. The appearance of the cave certainly corresponds with what is said about it in Scripture—"It was a cave, and a stone lay upon it" (St. John xi. 38). Near to the cave are the ruins of a fort built by queen Melisinda in 1132, to protect the nunnery founded by her in honor of Martha and Mary.

BETHEL, a t. in Oxford co., Me., 70 m. n.n.w. of Portland, noted for attractive scenery of mountains and water-falls; among the more conspicuous are Glass Face and White Cap mountains, and Partridge, Rumford, and Screw Auger falls. The White mountains, 25 m. away, can be seen from the town.

BETHEL, called Betein by the natives, about 10 m. from Jerusalem, mentioned in Scripture as the scene of Jacob's dream. Here also Abraham pitched his tent. Now a heap of ruins, almost entirely deserted, or only inhabited by a few straggling Arabs.

BETHELL, the Right Hon. RICHARD, Baron WESTBURY, an eminent lawyer, b. at Bradford, Wiltshire, in 1800, son of a physician at Bristol. From Bristol grammar-school, he went, at the age of 14, to Wadham college, Oxford, where he was first class in classics, and second class in mathematics, and took his degree of B.A. at the early age of 18. After being a private tutor at Oxford, he studied law, and was called to the bar at the middle temple in Nov., 1823. In 1840, he was made a queen's counsel. Elected, in April, 1851, M.P. for Aylesbury, on the formation of the Aberdeen ministry in Dec., 1852, he was made solicitor-general, and shortly after knighted. From Nov., 1856, to Mar., 1858, he was attorney-general. In 1861, he was made lord chancellor, and at the same time raised to the peerage. He resigned the great seal, however, in 1865, and on July 20, 1873, he died. B. was conspicuous for his exertions in the cause of law reform, in improving the system of education for the bar, and in abolishing the ecclesiastical courts, etc.

BETHESDA, POOL OF, meaning "house of pity." The scene of Christ's cure of the impotent man (St. John v. 2–9), and resort of the "impotent, blind, halt, and withered," once filled with water, "which an angel went down at certain seasons and troubled," is now dry and used as a deposit for dirt and rubbish. It is situated within the gates of Jerusalem, near the St. Stephen's gate and the temple of Omar; measures 460 ft. in length, by 130 in breadth, and 75 in depth.

BETH-HORON ("house of the hollow"), two villages of Palestine, 9 to 12 m. from Jerusalem, upper and lower; built by Sherah, a woman of Ephraim. Joshua drove the five kings of the Amorites down the pass of the lower Beth-Horon, and Solomon fortified both places. From Jerome's time until the beginning of the 19th c. the towers seem to

have been unnoticed. The present villagers are known as "Upper" and "Lower Beit-ur."

BETHLEHEM, a village in Grafton co., N. H., much frequented by visitors to the White mountains; 5 m. from Littleton; pop. '80, 1,200. Its situation is high, commanding beautiful views; and its atmosphere is found beneficial to sufferers with "hay-fever."

BETH'LEHEM, is the name of the chief settlement of Moravians in Pennsylvania, United States.

BETHLEHEM (*ante*), a village in Pennsylvania, on the Lehigh river, at the terminus of the North Pennsylvania railroad, 51 m. n. of Philadelphia; founded by Moravians in 1741; pop. '80, 5195. It is a place of summer resort, and noted for manufactories of iron and zinc. The Moravians (United Brethren) have a fine church, a seminary for women, and other educational and benevolent institutions. In 1866, the Lehigh (Episcopal) university was established in South Bethlehem, chiefly through the generosity of Asa Packer, who gave it 56 acres of land and half a million of dollars. In 1878, there were 14 professors and instructors, and 113 students; John M. Leavitt, D.D., president.

BETH'LEHEM, or BEIT-LAHAM, meaning "house of bread," celebrated in Scripture as the birthplace of our blessed Saviour, and of king David, is now a small unwalled village, situated at a distance 5 m. s. of Jerusalem. The pop., about 3000 souls, is wholly Christian—that is, Latin, Greek, and Armenian. The village is situated in the center of a most interesting country; and the roof of the Latin monastery—the only public building of any importance, inclosing the cave which is the alleged place of our Lord's nativity—commands a beautiful and extensive view of the surrounding country: in the distance, e., are the mountains of Moab and the plains of the Jordan; s., stands the hill of Tekoah, familiar as the scene of the pastoral life of the prophet Amos; beyond, and rather more to the e., lies the wilderness of Engedi, to which David retreated for the purpose of concealing himself against the pursuit of Saul, and where the allied armies of the Amorites, Moabites, and others, encamped when they came forth against Jehoshaphat; n., is the road to Jerusalem, with the mountains of Judea and Rachel's tomb. The convent of the Nativity, which incloses the supposed manger, etc., is a large square building, more resembling a fortress than the quiet habitation of the recluse, was built by the empress Helena, 327 A.D., but destroyed by the Moslems in 1236, and, it is supposed, restored by the crusaders. Within it is the church of the Nativity, which, like and in connection with the church of the Holy Sepulchre at Jerusalem, is subdivided among the Latins, Greeks, and Armenians, each community having a separate portion of the edifice for devotional purposes. The church is built in the form of a cross; the nave, which is by far the finest part of the building, belongs to the Armenians, and is supported by 48 beautiful Corinthian columns of solid granite, each between 2 and 3 ft. in thickness, and about 17 in height. The other portions of the church, forming the arms of the cross, are walled up. At the further end of that section, which forms the head of the cross, and on the threshold, is a sculptured marble star, which the Bethlehemites say covers the central point of the earth! Here a long intricate passage descends to the crypt below, where the blessed virgin is said to have been delivered. The walls of the chamber are hung with draperies of the gayest colors; and a silver star, with the words, "*Hic de virgine Maria Jesus Christus natus est,*" marks the spot of the nativity. The manger stands in a low recess cut in the rock, a few feet from this star.

The other objects of interest in the church are the chapel and tomb of St. Jerome, who became a monk of this convent towards the end of the 4th c.; the chapel and tomb of Santa Paula, a Roman lady, and the founder of several nunneries at Bethlehem; the tomb of St. Eudosia; and the pit into which it is supposed the bodies of the murdered innocents were cast. B. is under the jurisdiction of the pasha of Jerusalem. The Bethlehemites chiefly gain their subsistence by the manufacture and sale of crucifixes, beads, boxes, shells, etc., of mother-of-pearl and olive-wood. Much wine is made at B., which is considered all over Palestine next best to the Lebanon wine.

BETHLEHE'MITES, or BETHLEHEMITE BROTHERS, the name of an order of monks at Cambridge in the 13th c.; also of an order founded in Guatemala, 1673. The followers of Jerome Huss were styled B., from Bethlehem church in Prague, where their leader preached.

BETHLEN-GABOR (or, as he would be called in western Europe, GABRIEL BETHLEHEM or BETHLEN, it being a common custom in Hungary and Transylvania to make the baptismal follow the family name) was descended from an ancient and distinguished Protestant family of upper Hungary, which also possessed important estates in Transylvania, and was born in 1580. He rose to prominence during the troubles which distracted the principality in the reign of the two Bathories, Sigismund and Gabriel; and on the death of the latter of these unfortunate princes, succeeded (1613), by the aid of the sultan, in being chosen sovereign prince of Transylvania, the house of Austria being at that time in no condition to offer effective opposition. In 1619, when the Bohemians rose in defense of their religious and political rights, they looked eagerly for support to B., who had already gained a wide reputation as a warrior and a champion of Protest-

antism; and the Transylvanian prince, too glad of such an opportunity to gratify his ambition at the expense of his enemy, Austria, eagerly proffered his support. He accordingly marched into Hungary, took Kaschau, his advance more resembling a triumphal procession than a hostile invasion, and on arriving under the walls of Presburg was greeted with every mark of joy by the citizens. With an army now swelled by Hungarian volunteers to nearly 100,000 men, he pursued his route towards Vienna, driving before him the Spaniards under Bucquoy, and the Austrians under Dampierre; and would doubtless have captured the capital had not the severity of the season and the want of provisions, combined with the reinforcement of his opponents, and the defeat of his lieutenant, Ragotski, in Hungary, compelled him to retreat for a time. However, though he retired as far as Kaschau, he did not relinquish his hold of Hungary, of which, by the assembled diet, he had been crowned king at Presburg, 25th Aug., 1620; but, resuming the offensive, on the defeat and death of Bucquoy, before Neuhausel, he recovered the fortresses which the imperialists had retaken, and spread devastation and terror to the gates of Vienna. His allies, the Protestants of Germany, being apparently crushed, B. concluded peace with Ferdinand II., receiving the town of Kaschau, with seven Hungarian counties adjoining Transylvania, the principalities of Oppeln and Ratibor in Silesia, and the dignity of prince of the empire. This treaty, however, was soon broken by the emperor, who thought so favorably of his own situation as to imagine he could violate his agreement with impunity; but he was soon undeceived, for B., raising an army of 60,000 men, invaded Moravia, obtained the solemn renewal of the former treaty, and then retreated homewards. His marriage with Catharine of Brandenburg in 1625 involved him once more in the thirty years' war; but he finally retired from the contest in the following year, and thenceforth devoted himself exclusively to the internal affairs of Transylvania. He died in 1629, after a lingering and painful illness. B.'s reign was a glorious and flourishing epoch in the history of the little principality; for not only did the great successes achieved through his military talents give a prestige to its arms, but his protection of science and letters, in both of which he was well accomplished, did much to aid the progress of learning. He founded the academy of Weissemburg at Karlsburg, and installed there, as professors, Opitz, Alstedt, Biesterfild, and Piscator.—His brother STEPHEN succeeded him, but was soon compelled to resign the throne.—To the same family of Bethlen belong JOHN and WOLFGANG, both chancellors of Transylvania, the former of whom is celebrated for his work, *Rerum Transylvanicarum, libri iv.* (Hermannstadt, 1683), which gives the history of the principality from 1629 to 1663; and the latter of whom wrote a history in 16 books, the MS. of which, from long neglect, had been much damaged, but which was afterwards restored and completed, and published (6 vols.) at Hermannstadt in 1792, under the title of *Wolfgangi de Bethlen Historia de Rebus Transylvanicis* (1526–1609).

BETHNAL GREEN, an eastern suburb of London, in Middlesex, including Victoria park. Pop. '71, 120,104, many being silk-weavers. It possesses a museum, a branch of the one at s. Kensington.

BETHSAIDA, on the lake of Galilee, metioned in Scripture as the city of Peter and Andrew and Philip, and now a heap of ruins overgrown with grass.

BETHSHEMESH ("house of the sun," or "sun town;" modern name *Ain-esh-Shems*, "fountain of the sun," now distinguishable by neither house nor fountain from which it was likely to derive its name), a ruined city of Palestine, 15 m. w.s.w. of Jerusalem, finely situated on the point of a low ridge, commanding an extensive view of the country, rendered interesting by the exploits of Samson. B. was a sacerdotal city belonging to the tribe of Judah, bordering alike on the possessions of Dan and of the Philistines, and fixed by Eusebius ten Roman miles from Eleutheropolis, on the Nicopolis road. It is interesting as the place where the Ark of the Lord first rested, after the Philistines had sent it back (1 Sam. vi.). One of Solomon's twelve purveyors resided at B., where also was fought the battle between Judah and Israel, in which Jehoash captured Amaziah (2 Kings xiv. 11, 13.). B. was taken by the Philistines during the reign of Ahaz, and from that time disappears from sacred history.

BETHUNE, a t. of France, in the department Pas-de-Calais, situated on a rock overlooking the river Brette, and the canals of Lawe and Aire, 16 m. n.n.w. of Arras. It is strongly fortified, part of the works and the citadel having been constructed by Vauban. It has manufactures of linen and cloth, and a considerable trade in the agricultural produce of the surrounding country. Taken by the French in 1645, it was retaken by the allies in 1710, but was restored to France by the treaty of Utrecht. The first artesian wells are said to have been bored here. Pop. '76, 9315.

BETHUNE, GEORGE WASHINGTON, D.D., 1805-62; b. New York; son of a Scotch merchant and philanthropist; educated at Dickinson college and Princeton theological seminary; in 1828 pastor of a Dutch reformed church at Rhinebeck; then at Utica, N. Y.; and in 1834 in Philadelphia. In 1849 he took charge of a newly formed congregation in Brooklyn; ten years later visited Italy to improve his health; returned to New York and officiated a short time, and in 1861 again went to Italy, where he died suddenly from apoplexy. In literature he was known as the author of *Lays of Love and Faith, Early Lost and Early Saved, The History of a Penitent,* a memoir of his mother,

Anna Graham, *Lectures on the Heidelberg Catechism*, and as editor of *British Female Poets*. His last public effort in his own country was an eloquent speech made at the great union meeting in New York, April 20, 1861. He was noted as an elegant scholar, a fine conversationalist, and a lover of woodland sports.

BE'TICK, or BE'TIK, on the river Oxus, central Asia, "one of the greatest ferries between Persia and Turkestan." Lieut. Burnes, who in 1834 published an account of his travels in central Asia, says the Oxus is here 650 yds. broad and 25 to 29 ft. deep.

BET'JUANS, or BECHUA'NAS, the name of an extensive nation of southern Africa, occupying the country between 23° and 29° e. long., and extending from 28° s. lat. northward beyond the tropic of Capricorn. The B. are generally of a peaceful, indeed cowardly disposition, and are divided into many tribes under the government of chiefs, who exercise a kind of patriarchal authority over them. According to Dr. Livingstone, the different tribes take their names from certain animals, "showing probably that in former times they were addicted to animal worship. The term Bakatla means 'they of the monkey;' Bakuena, 'they of the alligator;' Batápi, 'they of the fish;' each tribe having a superstitious dread of the animal after which it is called. They also use the word 'bina,' to dance, in reference to the custom of thus naming themselves, so that when you wish to ascertain what tribe they belong to, you say, 'What do you dance?' It would seem as if that had been part of the worship of old." Many tribes formerly existing are extinct, as is evident from the names that have now no living representatives. The B. have a vague notion of a supreme being, but no intelligent idea of his attributes. Dr. Livingstone describes the tribe to which he attached himself—the Bakuena or Bakwains—who are favorable specimens of the nation, as generally slow "in coming to a decision on religious subjects; but in questions concerning their worldly affairs they are keenly alive to their own interests." In all agricultural matters they are very acute, exhibiting a wonderful knowledge of the properties of the soil, as well as of the nature and habits of animals. They have a superstitious reverence for a class of imposters calling themselves "rain-doctors," who profess to be able to bring down rain in dry seasons by a certain specific, composed of all kinds of disgusting animal and vegetable substances. One peculiarity of the B. is their inability to build their houses square; all erections take a circular form.

BETLIS. See BITLIS, *ante*.

BETROTHMENT, a mutual engagement by a man and woman with a view to marriage. This anciently consisted in the interchange of rings, kissing, joining hands, and the testimony of witnesses; and the ecclesiastical law punished the violation of such B. by excommunication; but such a spiritual consequence was abolished by the 26 Geo. II. c. 33. A previous B. had also been regarded as a legal impediment to marriage with another. "It was not," says Mr. Macqueen, in his *Treatise on the New Divorce Jurisdiction*, 1858, p. 73, "by the axe that the promoter of the English reformation extinguished his marriage with Anne Boleyn. He first carried her into the ecclesiastical court, and there obtained a sentence, on the ground of her alleged precontract with Northumberland." The aggrieved party, since the 26 Geo. II., has been left to the only remedy of an action for breach of promise. In Scotland there is the same mode of redress consequent on a refusal to proceed to matrimony; but in that country, where the B. or engagement can be shown to have been a clear, free, and deliberate *present consent* on the part of both the man and woman to form the relationship of husband and wife, such a contract may be enforced against the recusant party; and indeed it constitutes marriage itself. See MARRIAGE, PROMISE, HUSBAND AND WIFE.

BETTERTON, THOMAS, a celebrated actor, for about half a century the chief ornament of the English stage, was born in London, 1635, and died there in 1710. The best contemporary judges, such as Addison, Cibber, etc., bear admiring witness to his dramatic powers, which overcame the natural disadvantages of a low voice, small eyes, and an ungainly figure. His private character was highly estimable, cheerful, modest, and generous. After a retirement of many years, it became known that his circumstances were very straightened, and it was determined to give him a public benefit. On the 6th April, 1709, the spirited veteran (then in his 74th year) appeared with immense *éclat* in the youthful part of Valentine in Congreve's *Love for Love*. He acted several times again. Mrs. B. took the same rank among contemporary actresses as her husband did among actors.

BETTING, or WAGERING, is an inveterate practice of the English, which is exemplified in almost all classes of society, but more particularly in relation to horse-racing; bets as to which will be the winning horse at a particular race, being entered into by the highest as well as the lowest of the people. Sanctioned by fashion, betting on horses is carried on to so ruinous an extent in the metropolis that the legislature has interfered to check the evil. The haunts of betters called BETTING-HOUSES are suppressed by the 16 and 17 Vict. c. 119. The act declares them to be a common nuisance, and contrary to law, and prohibits them under very severe penalties. But it provides that its enactments shall not extend to stakes or deposit due to the winner of any race, or lawful sport, game, or exercise. The act was extended to Scotland in 1874. See GAMBLING.

BET'TOLA, a t. of northern Italy, in the province of Piacenza, about 20 m. s.w. of the town of the same name. It is situated on the Nure, in a fertile district. Pop. 5668.

BETULA. See BIRCH.

BETULA'CEÆ, or BETULI'NEÆ. See AMENTACEÆ and BIRCH.

BET'WAH, a river of India, which, after a n.e. course of 340 m., joins the Jumna on the right, about 30 m. to the e.s.e. of Calpee. It rises in the Vindhya mountains, which, uniting the w. and the e. Ghauts at their northern extremities, form the dividing ridge between the basins of the Nerbudda and the Ganges. It runs through beds of iron ore, and waters the towns of Bilcah and Jhansi. The source of the B. is in lat. 23° 14′ n. and long. 77° 22′ e., and its mouth in lat. 25° 57′ and long. 80° 17′. It is described as a very great river, being, even in the dry season, half a mile wide at its junction with the Jumna. It is, however, not navigable in any part of its course.

BEUKELZOON, WILLIAM, a person in humble life, belonging to the small town of Biervliet, in Holland, was the first who succeeded in salting and preserving herrings in a satisfactory manner. This improvement, which is said to have taken place in the year 1336, communicated a great impetus to the industry of the fisheries of Holland. It is related that the emperor, Charles V., made a pilgrimage to the tomb of B., and there ate a herring in expression of his gratitude for the invention. The derivation of *pickle* from B.'s name, also written Beukels, Bökel, etc., is fantastic. B. died in 1397.

BEULÉ, CHARLES ERNEST, 1826–74; a French archæologist and author, educated in the normal school at Paris, and sent to Athens as one of the professors of the school established there in 1852. He discovered the propylæa of the acropolis, and wrote *L'Acropole d'Athènes*, which was published by the French government. Honors came rapidly, and he was soon a member of all important scientific societies, and of the legion of honor. His later years were devoted to politics. Among his works are *Studies in the Péloponnesus*, *The Moneys of Athens*, *History of Sculpture before Phidias*, and *History of Greek Art*.

BEUST, FRIEDRICH FERDINAND FREIHERR VON, German statesman, one of the most prominent modern politicians. His family is of old nobility, distinguished both in the field and the cabinet. B. was b. on 13th Jan., 1809, at Dresden, and after a careful preliminary education in Dresden, he attended the universities of Göttingen and Leipzic. Having conceived early a liking for politics, he devoted himself to diplomacy. After spending some time in travel (1834–35), he served as secretary of embassy, first in Berlin, and then in Paris. In 1838, he represented his government at Munich, where he began to show his diplomatic talents, and soon acquired a certain celebrity. Eight years later, he went to London in the same character, from which he was removed in 1848 to Berlin. When called back to Dresden in 1849, he received the portfolio of foreign affairs. In this office, he declared against the adoption of the new constitution for the German empire, and when thereupon an insurrection broke out in Dresden, he called in the assistance of Prussian military, which speedily crushed it. A few years later, he was made minister of the interior. On the death of Frederick VII. of Denmark (1863), B. came forward prominently as the exponent of the German national feeling on the Slesvig-Holstein question. In the name of his government, he disavowed the London protocol, and urged a policy favorable to the wishes of the duchies, and in harmony with the national feeling of Germany. And, indeed, so prominent and popular did he become at this time, that he was sent as representative of the German bund (the first that ever was sent) to the London conference, where he stood his ground firmly, taking for his basis the principle of nationalities. Always the friend of Austria, he naturally supported that country in the crisis of 1866, joining in the declaration of war against Prussia, against the wishes of at least the liberal party in Saxony. After the termination of the "six weeks' war," he was obliged, at the demand of Prussia, to resign his office. He has since entered the service of Austria, and risen to the head of affairs. The chief result of his policy in the reorganization of the empire is the reconciliation of Hungary (1867) on the footing of its remaining a separate kingdom. See GERMANY. In 1871, he resigned the office of chancellor, and from that year till 1878 was ambassador in England.

BEU'THEN, or BÜTOM, a t. of Prussian Silesia, the capital of a circle of the same name, in the government of Oppeln, and 50 m. s.e. from Oppeln, near the Polish frontier. It has manufactures of woolen cloths and earthenware. The language generally spoken is Polish. Pop. '75, 19,367.

BEVEL, a term used by builders to describe a sloped or canted surface. See SPLAY.

BEVELAND, NORTH and SOUTH, two islands in the estuary of the Scheldt, Netherlands province of Zeeland. South B. is the largest and most fertile, containing 84,000 acres, with a pop. of 34,325. The chief town, Goes (Hús), near the n. side, is well built, and has 6239 inhabitants. Making salt, leather, beer, candles, oil, chocolate, weaving cottons, and book-printing are the chief industries. South B. produces wheat and other grain, colza, madder, potatoes, and fruit abundantly. Fish are plentiful. North B. is low and marshy, has an area of 15,250 acres; pop. '75, 7308, employed

with agriculture. Both islands have suffered dreadfully from inundations. In 1532, North B. was completely covered with water, many of the inhabitants perishing; and it remained submerged for several years. At the same time, the flourishing town of Romerswaal was separated from South B., and afterwards so encroached on by the sea, that the whole of the inhabitants had to leave it. The islands also suffered considerably from inundation in 1808. Within recent years, much good has been effected by drainage,

BEVELLED-GEAR. See GEARING.

BEVERIDGE, WILLIAM, Bishop of St. Asaph, was b. at Barrow, Leicestershire, in 1638. Entering St. John's college, Cambridge, at the age of 15, he at once became remarkable for his diligence and piety, and particularly for his devotion to the study of oriental languages, a treatise on which he published at the age of 20. In 1660, having obtained his degree of M.A., he was ordained both deacon and priest. After many excellent preferments, in which he was remarkable for his devotion to his pastoral duties, he was, in 1704, appointed to the bishopric of St. Asaph, having previously refused to accept that of Bath and Wells, on the deprivation of Dr. Thomas Kenn, for not taking the oaths to the government of William III. He died March 5, 1708, leaving the great bulk of his property to the societies for the promotion of Christian knowledge, and the propagation of the gospel in foreign parts, and a reputation for sincere piety and great learning. His works, which, besides the treatise mentioned, include another on chronology, a collection of canons from the time of the apostles to that when the synod of Constantinople restored Photius, and various sermons and works of a religious kind, with a life, were collected and published in 9 vols. 8vo in 1824, by the Rev. Thomas Hartwell Horne.

BEVERLAND, ADRIAN, a Dutch scholar who, by several of his writings, but more especially by his unorthodox interpretation of the fall, caused great excitement among the theologians of his day. He was born at Middelburg, in Zeeland, about the middle of the 17th c.; had studied law, visited the Oxford university, and was settled as an attorney in Holland, when, in 1678, he published his pamphlet, *Peccatum Originale*, which was not only burnt at the Hague, but led to his own imprisonment, and to his expulsion from Utrecht and Leyden, whither he had wished to betake himself. On his return to the Hague, he wrote *De Stolatæ Virginitatis Jure* (the Hague, 1680), which gave still greater offense than his first work. Soon after, he came to England, where he found a supporter in Isaac Vossius, and probably received his degree as doctor of civil law in Oxford. But it would appear from his virulent attacks against several dignitaries of the English church, that he met with a good deal of theological opposition in England also. Probably it was the death of his benefactor, Isaac Vossius, in 1689, that led him in 1693 to repudiate his earlier writings, and to regret their tone. Having become insane, he appears to have died in England soon after 1712. In spite of his numerous enemies, B. stood high in the friendship of some of the most distinguished men of his time. His views respecting original sin have been often expressed by others, both before and after his day, though in a less flippant style. His works are now mere bibliographical curiosities.

BEVERLEY, the chief t. of the e. Riding of Yorkshire, 1 m. w. of the river Hull, with which it communicates by canal, and 10 m. n.n.w. of the city of Hull. B. formerly returned two members to parliament, but was disfranchised in 1870. Its trade consists in corn, coal, and leather, and there are several whiting and agricultural implement manufactories. The finest object in B. is the superb Gothic minster or the collegiate church of St. John, ranking next to York minster among the ecclesiastical structures of the country, and exhibiting different styles of Gothic architecture; the oldest part being of the 13th century. The choir contains the celebrated Percy shrine, of the most exquisite workmanship. The grammar-school of B. is so old, that the date of its foundation is unknown. B. arose out of a priory founded about the year 700, and received its name from Beverlac, "lake of beavers," from the great number of these animals in a neighboring lake or morass. Pop. '71, 10,218.

BEVERLEY, JOHN OF, a prelate of the 7th and 8th c., born in Northumbria, and tutor of the venerable Bede. He was bishop in Hexham in 685, and archbishop of York in 687. In 717, he resigned and retired to a college which he had previously founded at Beverley, where he died in 721. Among his works are *Exposition of Luke, Homilies on the Evangelists*, and a number of epistles.

BEVERLOO', a village of Belgium, in the province of Limbourg, 12 m. n.w. of Hesselt. On the extensive heaths near is the permanent military camp for the instruction of the Belgian army.

BEVERLY, a t. in Essex co., Mass., on the Eastern railroad, 18 m. from Boston, connected with the city of Salem by a bridge. It has many fine residences of Boston merchants, which overlook its good harbor. Many of its people are engaged in the business of fishing. Pop. of township, '80, 8,445.

BEVERWYK, a pleasant village in n. Holland, with extensive meadows on one side and well-wooded country-seats on the other, 7 m. n. from Haarlem; pop. '75, 3339, who live by gardening and various trades. Strawberries and vegetables are cultivated for

the Amsterdam and Haarlem markets. There is a haven with a branch canal leading to the large canal from the North sea to Amsterdam.

BEWD'LEY (formerly Beaulieu, from its pleasant situation), a t. on the right bank of the Severn, in the n.w. of Worcestershire, 14 m. n.n.w. of Worcester. Pop. '71, 7614. B. returns one member to parliament. It has manufactures of leather, combs, lantern leaves, carpets, and iron and brass wares. The chief transit for goods is by the Severn. Near the town is a public park of 400 acres, with fine groves of elm, oak, and plane.

BEWICK, THOMAS, a celebrated wood-engraver, was b. at Cherryburn, near Newcastle-on-Tyne, in 1753. Apprenticed to Beilby, an engraver in Newcastle, he displayed such extraordinary aptitude in his art, that, at the age of 17, he was intrusted with the cutting of the whole of the diagrams in *Hutton's Treatise on Mensuration*. He afterwards illustrated *Gay's Fables*, obtaining in 1775, for one of the cuts, the "Old Hound," the prize which the society of arts had offered for the best wood-engraving. In 1790, B., who had entered into partnership with Mr. Beilby, completed, along with his brother John, who was his pupil, the illustrations for a *General History of British Quadrupeds*, a work which raised his reputation far above that of any of his contemporaries, and gained for him the honorable and not undeserved appellation of the reviver of wood-engraving. Considered as works of art, these illustrations are still unrivaled in graphic force of expression and fidelity to nature, though the great mechanical improvements in the art introduced since B.'s time have rendered them inferior in clearness and delicacy of execution to some of the best cuts of the present day. Assisted by his brother, B. illustrated Goldsmith's *Traveler* and *Deserted Village*, Parnell's *Hermit*, and Somerville's *Chase;* and in 1797 appeared the first volume of his *History of British Birds*, which was followed in 1804 by the second. This splendid work was entirely B.'s own, his brother having died in 1795. B.'s last work, the unfinished proofs of which he received the Saturday before his death, which took place at Gateshead, Nov. 8, 1828, is called "Waiting for Death," and represents an old worn-out horse, with great pathos and truth. It was designed to assist in the prevention of cruelty to animals. A large cut of a bull—of the Caledonian breed—is considered B.'s *chef-d'œuvre*. B. had many pupils, some of whom were afterwards eminent as engravers.

BEWLEY, ANTHONY, b. Tennessee, 1804; hanged by a mob in Texas, Sept. 13, 1860. In 1843, he entered the Missouri conference as a Methodist minister, but when the church divided on the slavery question he adhered to neither side, but preached independently, earning his living by manual labor. Other independents supported him, and he became by their consent a presiding elder. When the church in Missouri was reorganized in 1848, he came back to its service. In spite of the universal persecution of "abolition preachers," he kept the tenor of his way, and in 1858 was sent to Texas. He was driven out by violence, but returned to the work in 1860, saying to protesting friends, "Let them hang or burn me if they choose, a hundred will rise out of my ashes." But the opposition was so great that he was again compelled to leave. Then a reward was offered for his head, and he was kidnapped in Missouri, hurried off to Texas, and hanged.

BEX, a village of (1870) 3804 inhabitants, in the Swiss canton of Vaud, situated on the high-road to the Simplon, about 26 m. s.e. of Lausanne. It is remarkable for its extensive salt mines, salt works, and sulphur baths. One of the mines, called *Du Bouillet*, has a gallery 7½ ft. high, and 5 ft. wide, extending horizontally into the mountain a distance of more than 2000 yards. The quantity of salt annually produced at B. is between 1000 and 2000 tons.

BEXAR', a co. in s.w. Texas; intersected by the Galveston, Harrisburg and San Antonio railroad; 1450 sq.m.; pop. '70, 16,043—2303 colored. Productions, corn, cotton, wool, butter, and cattle. Co. seat, San Antonio.

BEXAR', SAN ANTONIO DE, a thriving t. of Texas, on the San Antonio river, at a distance of 110 m. to the s.w. of Austin city. It is growing rapidly in population (which amounted in 1870 to 12,256) and in wealth. The place possesses six newspapers, several seminaries, three flouring-mills, three breweries, etc. San Antonio de Bexar was famous in the conflicts between the Mexican authorities and the American adventurers, more especially for the indiscriminate slaughter by the former of col. Crockett and his garrison.

BEXAR' DISTRICT, or TERRITORY, a region of n.w. Texas between the Rio Pecos, New Mexico, and the Indian territory; pop. '70, 1077, about one person to 40 sq.miles. Most of the n.w. part is a high table-land without wood or water; the n.e. and e. portion is well watered by the streams that run into the Brazos and the Colorado.

BEY'ERLAND, a district in s. Holland, bounded s. by the Hollandish Diep and Haringvliet. It has several thriving villages, of which Old B. has 4620 inhabitants; South B., 1703; and New B., 1263; the whole canton, 16,000. The people are engaged in agriculture, have many orchards, and grow flax extensively. An inland shipping trade is carried on in summer.

BEYLE, MARIE-HENRI, 1783–1842; a French soldier and author, better known as "De Stendhal," the most celebrated of his many *noms de plume*. He was about to enter the polytechnic school, when by chance he was present at the battle of Marengo. Car-

ried away by enthusiasm, he enlisted as quartermaster of dragoons, rose to be lieutenant, and acted as aid-de-camp to gen. Michaud. After the peace of Amiens, he left the army and led a roving life—studying in Paris, becoming a mercantile clerk in Marseilles, running after a beautiful actress, who spoiled his romance by marrying a rich Russian—and returned to war in the commissariat of Napoleon's ill-fated Russian expedition, where he remained loyal to the fallen emperor. After the restoration he resided in Milan until 1821, when he was suspected of being a French spy, and hastily returned to Paris, remaining there nine years, acquiring fame as an accomplished writer and man of the world. In 1830, he was consul at Trieste, and afterwards at Civita Vecchia, finally returning to Paris a year before he died. He wrote lives of Haydn, Mozart, and Metastasio; a history of Italian painting; *Rome, Naples, and Florence* in 1817; a life of Rossini; *De l'Amour;* an essay on Racine and Shakespeare; and *Promenades dans Rome.* He was an admirable conversationist, full of anecdote and apt in application.

BEY'ROUT, or BEIRUT, the Berothai or Berothah of the Old Testament (2 Samuel viii. 8, and Ezekiel xlvii. 16); and the Berytus of the Romans. It was besieged and captured by Baldwin I., king of Jerusalem, in 1111; recaptured from the Christians in 1187. In 1197, it again came into the hands of the Christians, and then successively under the Saracen, Seljukian, and Turkish sultans. In course of the operations to support the Turkish claims against the assumed power of the pasha of Egypt, B., in 1840–41, was bombarded by the English fleet under sir C. Napier, taken, and delivered over to the Turks. There are three castles still standing out in the sea, whose battered walls bear witness to the efficacy of the British cannon. There are no ancient monuments worth visiting.

B. is a flourishing commercial town, situated in a most picturesque position on the coast of Syria, and at the foot of Lebanon, 55 m. from Damascus, and 147 from Jerusalem. It is the chief seaport, market-town, and emporium of all the trade with the shores of Syria, Palestine, and Cilicia; and has a pop. of about 70,000 (the majority of whom are Christians) against 12,000 in 1835. A considerable increase in population is due to the settlement, in 1860, of numbers of the Christian refugees from Damascus. Several British merchants are established in B., and there is a branch here of an English bank (the Ottoman). B. supplies the Lebanon, Damascus, and the n. of Syria to Antioch, and Joppa, with European manufactures and goods. French steamers, carrying mails, leave B. every week for Marseilles. British steamers ply regularly between England and B. every fortnight, bringing Manchester manufactures, prints, chintzes, Birmingham and Sheffield cutlery, etc., and returning to England with madder roots, wool, silk, and bitumen. Since 1859, a direct trade has been carried on between B. and the United States of America, the articles sent to the United States being wool and olive-oil; and since the opening of the Suez canal, a direct eastern trade in spices, indigo, and Mocha coffee has sprung up. There is good anchorage in the roadstead, with shelter during stormy weather in the Beyrout river, about 3 m. from the town; and in 1874, £10,000 was allotted by the authorities for the construction of a harbor. About 350 merchant vessels of different nations visit and leave B. every year. The commerce is steadily increasing. In 1848, the imports were only £546,266; in 1873, they were £1,323,152. The exports in 1848 amounted to £253,648; in 1873, they were £668,568. In 1853, the imports into B. from Great Britain were £225,875; in 1871, they had increased to £676,900. A commercial tribunal, composed of European and native merchants, to adjudicate all mercantile disputes and bankruptcies, has lately been established; and consuls from all nations reside at Beyrout. Ship-building has begun to attract the attention of the natives, who have built and launched at B. several vessels of 50 to 80 tons within the last few years. There are extensive factories in the neighborhood, producing "Syrian silk," which is much esteemed in the London and Lyon markets. In 1859, a line of omnibuses, the first ever seen in Syria, was established at Beyrout. The natives at first regarded them with great astonishment, and crowded from all sides to see them pass. A French company completed in 1863 a good road from B. to Damascus. In 1875, an English company completed an extensive system of water-works, bringing a supply of excellent water from the Nahr-el-kelb, or Dog river, a distance of 9 miles. The town has lately been improved by the removal of the walls which formerly surrounded it. From its proximity to the mountains of Lebanon, on which the climate is most agreeable and salubrious, B. is an attractive place of residence; and it might rise into importance but for its odious Turkish custom-house arrangements and system of government.

BEZA, THEODORE (properly, De Bèze), next to Calvin the most energetic and influential of the Genevese reformers, was born of a noble family at Vezelai, in Burgundy, 24th June, 1519. He received an admirable education in Orleans, from Melchior Wolmar, a German, who was especially learned in the Greek language, and also imbued with the principles of the reformation, which he communicated to his pupil. As early as 1539, B. became known as a writer of witty and elegant but indecent verses, the publication of which (1548) caused him many bitter regrets in after-days, when his heart was purer. In his 20th year, he obtained his degree as licentiate of civil law, and went to live in Paris, where he appears to have spent several years in a kind of fashionable dissipation, though he does not accuse himself of any gross profligacy.

B. possessed a handsome figure, which, together with his fine talents and good birth, opened to him the most brilliant prospects. Although not a priest, he pocketed the revenues of two benefices, while his income was largely increased by the death of an elder brother. It was the desire of his relatives that he should enter the church, but a private marriage which B. had contracted, rendered this impossible. A severe illness now attacked him, during the lapse of which, the folly and sinfulness of his career vividly presented themselves to his conscience; he repented, and on his recovery, in order to avoid the perils and perplexities of his position, he went to Geneva along with his wife, Oct., 1548. Shortly after, he was appointed Greek professor at Lausanne, an office which he held for ten years. In 1550, he published with success a melodrama, entitled *The Sacrifice of Abraham*, and delivered lectures on the epistle to the Romans and the epistles of Peter to crowded audiences. Out of these lectures ultimately sprang his translation of the New Testament into Latin. In 1559, he went to Geneva, where he became Calvin's ablest coadjutor, and was appointed a theological professor and president of the college. He had already signalized himself by his work *De Hæreticis a Civili Magistratu puniendis*, in which, like many other good but mistaken men, he approved of the burning of Servetus. His diplomatic tact was particularly good. He induced the king of Navarre to exert his influence on behalf of the persecuted French Protestants, and was persuaded by the latter to attend the conference of Catholic and Protestant divines, held at Poissy in 1561. Here his courage, presence of mind, and dexterity made a very favorable impression on the French court. Catharine de Medicis entertained so high an opinion of his abilities, that she desired him to remain in France. While in Paris, he often preached before the king of Navarre and Condé. On the outbreak of the civil war, he accompanied the latter as a kind of military chaplain, and after his capture attached himself to Coligny. In 1563, he once more returned to Geneva. In the following year, Calvin died, and the care of the Genevese church now fell principally upon his shoulders. He presided over the synods of French reformers, held at Rochelle in 1571, and at Nimes in 1572. In 1574, he was deputed by Condé to transact important business at the court of the Palatinate; and in 1586 measured himself with the Würtemberg divines, especially Jacob Andreä, at the religious conference held at Montbeliard. In 1588, his first wife died, and although verging on 70, he married another—an awkward circumstance, it must be confessed, and one which his enemies, the Jesuits, tried to make a handle of; but B., who still retained complete mastery over his faculties, retorted with his accustomed liveliness and skill. In 1597, his calumniators spread the extremely foolish report that B. was dead, and at the last hour had returned to the bosom of the church. The witty patriarch replied in a poem full of sparkling vigor. He died 13th Oct., 1605, at the ripe age of 86.

B. was thoroughly grounded in the principles of his master, Calvin, in whose spirit he vigorously ruled the Genevan church for forty years, exercising the influence of a patriarch. To secure its unity, strength, and permanence, he spared no pains, sacrificing even his personal possessions. By his abundant learning, his persevering zeal, his acute intellect, his fine eloquence, and his impressive character, he rendered it important services. His numerous theological writings, however, cannot be said to have proved attractive to posterity. They have almost ceased to be read. The works by which he is best known are his translation of the New Testament into Latin, and his *History of the French Protestants from* 1521 *to* 1563.

BEZANT. See BESANT.

BEZA'S CODEX, or CAMBRIDGE MANUSCRIPT, an ancient vellum containing the Greek text of the four gospels entire in the order used in the English Bible, the Acts (except a number of omissions), and fragments of the epistles. It is believed to date from the 6th c., and is noted for many interpolations, there being 600 in the Acts alone. It was presented to Cambridge university by Theodore Beza, who obtained it about 1562 from a Huguenot soldier who took it from a monastery in Lyons. It has been printed twice.

BEZ'DAN, a market-t. of the Austrian empire, in the Hungarian province of Bacs, about 3 m. e. of the Danube, and 12 m. w.n.w. from Zombor. Pop. '69, 7573.

BEZETHA, one of the four hills on which Jerusalem is built, n. of Antonia, from which it was separated by a deep ravine. It was not inclosed until Agrippa built the third wall.

BEZIERS, a city of France, in the department of Herault, at 43° 21′ n. and long. 3° 13′ e. It is pleasantly situated on a hill, in the midst of a fertile country, at the junction of the Orb and the canal du Midi, about 38 m. s.w. of Montpellier. It contains some interesting architectural and antique buildings—the principal being the cathedral, a noble Gothic edifice; the churches of La Madeleine and St. Aphrodise; and the ancient episcopal palace. The old citadel has been destroyed, but the walls still remain, and are made use of as a promenade. B. has manufactures of silk stockings, woolens, gloves, parchment, glass, soap, leather, and much esteemed confectioneries. It has also extensive brandy distilleries, and is the center of most of the trade of the district. The town is supplied with water raised from the Orb by means of a steam-engine. Pop. '76, 36,928.

B. is a place of great antiquity, and still contains Roman remains. It is historically interesting in connection with the massacre of the Albigenses, its inhabitants having been indiscriminately put to the sword by Simon de Montfort and the pope's legate, for having afforded protection to the fugitives in 1209. B. suffered also in the religious wars of the 16th century.

BEZIQUE (from Sp. *besico*, "little kiss," in allusion to the meeting of the queen and knave), a game at cards played with a double pack, from which the twos, threes, fours, fives, and sixes have been rejected. The remaining cards rank from ace down, as in whist. The dealer gives three cards to his adversary, three to himelf, then two to each, and lastly three to each, and turns a trump. Tricks are taken as in whist except when the cards are equal, such as two tens together, when the leader wins the trick. After each trick the player draws one card from the stock, the winner taking the top card and the loser the next, the trump card or the one exchanged for it being taken up last. The object of the game is to promote in the hand various combinations of cards which, when declared, entitle the holder to certain scores; to win aces and tens; and to win the so-called last trick. A declaration must be made as soon as the trick is taken and before drawing from the pack, and this is done by placing the declared cards (one of which must not have been declared before) face upward on the table; but they still form part of the hand and can be led or played just as though they had not been declared. (The rules are too long to be inserted here.) There are also three or four bezique, when three or four packs are used. The game is usually 1000 points, and the scores vary from 10, for the seven of trumps played or exchanged, to 500 for double bezique. If clubs or hearts are trumps, the bezique cards are queen of spades and knave of diamonds, and *vice versa* when spades or diamonds are trumps. The deal goes from one to another alternately until the game is finished.

BE'ZOAR (Pers. *pazar*, a goat; or *pa*, against, and *zachar*, poison), a concretion found in the stomachs of goats or antelopes, and formerly much valued on account of imaginary medicinal virtues, particularly as an antidote to poisons. Concretions of various kinds are found in the stomachs of herbivorous quadrupeds, very generally having for their nucleus some small indigestible substance which has been taken into the stomach. Sometimes they are of a radiating structure; sometimes formed of concentric layers; sometimes they are principally composed of superphosphate of lime, sometimes of phosphate of ammonia or magnesia. Other concretions found in the intestines, etc., of various animals are sometimes also called bezoar. See CALCULI. The value of a B. being supposed to increase with its size, the larger ones have been sold, particularly in India, for very great prices.

BHADAR'SA, a t. of British India, in the chief-commissionership of Oude, on the Tons, 75 m. e. from Lucknow. Pop. 5000, of whom 2000 are Mussulmans. Here is an eleemosynary establishment, founded by the Nawab Vizier Asaf ud Dowlah, with an endowment of 15,000 rupees a year, the proceeds of which are divided indiscriminately among Mussulman and Hindu religious mendicants. It is under the charge of a seiad, or descendant of Fatima.

BHADRINATH', a t. of Gurhwal, in the lieut.-governorship of the North-western Provinces, India, situated in a valley of the Himalaya, 25 m. to the s. of the Manah pass, which leads into Thibet. Lat. 30° 44′ n., long. 79° 33′ e. Its highest point is 10,294 ft. above the level of the sea; while, about 12 m. to the w., there is a group of summits, called the Bhadrinath peaks, having the respective elevations of 23,441, 23,336, 22,934, 22,754, 22,556, and 21,895 ft.; the e. also, and the s.w., presenting detached mountains of similar magnitude. B. is situated on the right bank of the Vishnugunga, a feeder of the Aluknunda, which itself again unites with the Bhageerettee to form the Ganges. The chief attraction of the place is its temple, which, though the actually existing edifice is modern, is said to be an establishment of great antiquity. This temple overhangs a tank of about 30 ft. square, which is supplied, by a subterranean passage, from a thermal spring in the neighborhood. As ablution in these waters is held to cleanse from all past sins, B. is a grand resort of pilgrims, every year bringing large numbers, but every twelfth year, when a periodical festival is celebrated, collecting fully 50,000. From Nov. to April, the temple and its deity are abandoned even by the attendant Brahmins, on account of the cold.

BHAGAVAD-GÎTÂ (i.e., Revelations from the Deity) is the title of a religious metaphysical poem, interwoven as an episode in the great Indian epic poem of the Mahâbhârata (q.v.) Two hostile armies, the nearly related Kurus and Pândus, are drawn up in opposition, ready for battle; the trumpets sound the opening of the combat; and the Pându Ardshuna mounts his chariot, which is guided by the Deity himself, as charioteer, in the human form of Krishna. But when Ardshuna perceives in the hostile army his relatives, the friends of his youth, and his teachers, he hesitates to commence the struggle, held back by the doubt whether it were lawful for him, for the sake of the earthly gain of reconquering his father's kingdom, to transgress the divinely approved ordinances for the government of the state. Upon this, Krishna sets forth, in a series of eighteen poetic lectures, the necessity of proceeding, unconcerned as to the consequences. In the progress of his long discourse, a complete system of Indian relig-

ious philosophy is developed, in which the highest problems of the human mind are treated with as much clearness of thought as elegance of language. It is impossible to determine exactly when and by whom the work was composed. It is not, however, one of the first attempts of Indian philosophy, for it is rather of an eclectic nature; and before it could have been composed, there must have been a period of long-continued intellectual cultivation in many philosophic schools. It is not unlikely that it was written in the 1st c. after Christ. The work is looked upon with great reverence in India, and it has accordingly been made the subject of numerous commentaries (the best is that of Sridhara-Svâmin, published in Calcutta in 1832), and it has likewise been translated into various Indian dialects. Five different metrical versions in Hindi appeared in Bombay in 1842; a translation into the Telugu dialect in Madras, 1840; into the Canarese, Bangalore, 1846, etc. The best critical edition of the Sanskrit text is that of A. W. von Schlegel (2d ed., Bonn, 1846), to which is added a Latin translation. Among the other translations may be mentioned that into English by Wilkins (Lond. 1785), who had the credit of first making the work known in Europe; that into German, by Peiper (Leip. 1834); and the Greek translation by Galanos (Athens, 1848). W. von Humboldt's treatise, *Upon the Episodes of the Mahâbhârata, known under the Name of the Bhagavad-Gîtâ* (Berlin, 1827), contains an admirable exposition of the philosophy of the poem.

BHAGULPORE', the capital of a district and division of the same name in Behar, presidency of Bengal, lat. 25° 11′ n., long. 87° east. It stands on the right bank of the Ganges, which is even here 7 m. wide in the rainy season. A seminary for English instruction has been here established by the British government. It is the headquarters of the troops for keeping in check the Sonthal tribes. Pop. '71, 69,678. In the vicinity of the town are two round towers of about 70 ft. in height, of the origin or object of which nothing is known.—2. B., as a district, contains 4527 sq.m., and '71, 1,826,290 inhabitants. It lies s. of Nepaul, in lat. 24° 17′ to 26° 20′ n., long. 86° 15′ to 88° 3′ east. About a fifth is covered by hills, which, stretching to the s.w., connect themselves with the Vindhya mountains, the grand dividing-ridge between the Nerbudda and the Ganges.—3. The division of B. has an area of 18,685 sq.m., and a pop. '71, 6,613,358.

BHAMO', a t. of Burmah, on the Upper Irrawaddy, 40 m. to the w. of the Chinese frontier, and 180 to the n.n.e. of Ava. It contains 1000 houses, and has round it many populous villages. It is the chief mart of the trade with China, the imports being woolens, cottons, and silks, which are brought chiefly by caravans. B. has also a considerable trade with the tribes of the neighborhood, who exchange their native produce for salt, rice, and a sauce made of dried fish. There is a British resident, and steamers ply to Rangoon.

BHANG, the eastern name for hemp (q.v.).

BHANPURA. See BAMPURA.

BHARTRIHARI is the name of a celebrated Indian writer of apothegms. Little is known regarding the circumstances of his life. A legendary story makes him the brother of king Vikramâditya, who lived in the 1st c. B.C., and relates of him, that after a wild licentious youth, he betook himself in later years to the ascetic life of a hermit. His name has been given to a collection of 300 apothegms—whether it be that he actually wrote them, or, as is more probable, that the apothegms were popular works, written by many various authors, but ascribed, according to the Indian custom, to some personage well known among the people in legends and tales. Cheerful descriptions from nature, and charming pictures of love, alternate in these apothegms, with wise remarks upon the relations of life, and profound thoughts upon the Deity and the immortality of the soul. Bohlen has published an excellent critical edition (Berlin, 1833), with a supplement, *Variæ Lectiones* (Berlin, 1850), as well as a successful metrical translation into German (Hamburg, 1835). B. has a certain special interest as having been the first Indian author known in Europe, 200 of his apothegms having been translated in 1653, by the missionary, Abraham Roger, in a learned work published at Nuremburg, under the quaint title, *Open Gates to Hidden Heathenism.*

BHATGONG', one of the chief towns of Nepaul, situated about 9 m. s.e. from Khatmandu. It contains a palace of striking appearance, and other notable buildings. It is the favorite residence of the Brahmans of Nepaul, who form the greater part of its inhabitants. Its present population is estimated at 12,000, but it is supposed to have once contained 60,000 inhabitants

BHATNIÁR, or BHATTIS, a people of northern Hindustan, in the British district of Hissar. There are two races, one of Mohammedans of Rajput descent, who are the influential class; the other the common people, known as Játs, who adhere to the religion of their immediate superiors, and are by them treated with moderation. A portion till the soil, but most of them are shepherds. While under native rulers they appear to have been a horde of freebooters, savage and even ferocious in disposition. Their rajah could raise 20,000 or 30,000 men for war, but they had nothing like discipline. Their former capital (of the same name) was taken in 1398 by Timur, at a later period by George Thomas, an English military adventurer, and in 1805 by the rajah of Bikánir, who still retains authority over it. The principal town is Sirsá, between which and Bháwalapur a route for commerce has been opened.

BHAVANI-KUDAR', or BHOVANI-KUDAR, a t. in the presidency of Madras, in the district of Coimbatoor, 58 m. to the n.e. of the city of that name. It takes its name from its position at the confluence of the Bhavani or Bhovani, and the Cauvery. It is worthy of notice chiefly for its temples of Vishnu and Siva. Pop. '71, 6776.

BHAWLPOOR', the capital of the protected state of the same name in India, is situated on a tributary of the Ghara, which, formed by the junction of the Sutlej and the Beas, falls into the Chenab about 50 m. further down, in lat. 29° 24′ n., and long. 71° 47′ east. It has a circuit of 4 m.—part, however, of the inclosed space being occupied by groves of trees; and its population is estimated at 20,000. B. has manufactures of scarfs and turbans, chintzes, and other cottons, and the immediate neighborhood is remarkably fertile in grain, sugar, indigo, tobacco, and butter, with an abundance of mangoes, oranges, apples, and other fruits, in perfection. For external commerce, too, B. is favorably placed, standing at the junction of three routes respectively from the e., s.e., and s.; while, towards the n., the Hindu merchants, who are very enterprising, have dealings with Bokhara, and even with Astrakhan.—2. The state of B. lies in lat. 27° 41′ to 30° 25′; and long. 69° 30′ to 73° 58′ east. The area is about 15,000 sq.m.—the population being approximately estimated at 472,800 in 1871, or rather more than 31 inhabitants to a square mile. The country is remarkable level: only about one sixth is capable of cultivation. The fertile portion, skirting the Ghara and the Indus, has a purely alluvial soil; but the remainder, though presenting many traces of former cultivation and population, is now, from want of water, an irreclaimable desert either of hard dry clay, or of loose shifting sands. Besides beasts of chase, such as tigers, boars, etc., B. abounds in domestic animals, such as camels, kine, buffaloes, goats, and broad-tailed sheep. In few parts of the world are provisions finer or cheaper. The principal exports are cotton, sugar, indigo, hides, drugs, dye-stuffs, wool, ghee or butter, and provisions in general. The principal imports are the wares of Britain and India. In 1866, the state, at the request of the leading men, was taken under British management till the young nabob should be of age. The great majority of the inhabitants are Mohammedans.

BHEL, or BAEL. See ÆGLE.

BHIL, a native tribe in central India, friendly to the English, which has done good service in suppressing the predatory habits of its neighbors. In common with other hill-tribes, the B. are supposed to have been aborigines in their region. They are of dark complexion and diminutive stature, but active and capable of enduring much fatigue. It is with much difficulty that they are reconciled to the life of agriculturists.

BHOOJ, the capital of Cutch, in India, situated at the foot of a fortified hill of the same name, where a temple has been erected to the cobra de capella, in lat. 23° 15′ n., and long. 69° 44′ e., about 35 m. from the sea. It contains about 20,000 inhabitants. Its mosques and pagodas, interspersed with plantations of dates, give to the town an imposing appearance from a distance. In 1819, it suffered severely from an earthquake. It is celebrated over India for its manufactures in gold and silver.

BHO'PAL, the capital of the territory of the same name, in India, lies in lat. 23° 14′ n., and long. 77° 33′ east. It is surrounded by a dilapidated stone wall of about 2 m. in circuit. The fort, which is the residence of the nawab, stands on a huge rock outside the town. B. is worthy of notice mainly in connection with two immense tanks in the immediate neighborhood—one of them being 2 m. in length, and the other measuring 4¼ m. by 1½. As each sends forth a river, they have most probably been formed by the embanking and damming up of their respective streams.—The territory of B. is a protected state, under the immediate superintendence of the governor-general. It is situated within the basins of the Ganges and Nerbudda, in lat. 22° 32′ to 23° 46′ n., and long. 76° 25′ to 78° 50′ e.; its area being estimated at 6764 sq.m., and its population, on an assumed average for Central India, at 662,872. Though the vast mass of the people are Hindus, yet the government is Mohammedan, and is understood to be more popular in its character than any other in India.

BHOTAN', or BOO'TAN, an independent territory in the n.e. of India, on the southern slope of the Himalayas, in lat. 26° 18′ to 28° 2′ n., and long. 88° 32′ to 92° 30′ e., being bounded on the e. by Assam, on the s. by Bengal, and on the w. by Sikkim. With an area of 10,000 to 20,000 sq.m., it was estimated in 1864 to contain only 20,000 inhabitants, but later information points to a larger figure. The whole surface may be described as mountainous, with a gradual slope from n. to south. Generally speaking, the middle ranges are the most productive. While the s. presents but a scanty vegetation, and the n. rises far above the limit of perpetual snow, the central regions, at an elevation of 8000 or 10,000 ft. above the sea, are covered with the finest forests of oak and pine. Nearly all sorts of grain—wheat, barley, rice, maize, and buckwheat—are here and there cultivated on favorable spots: but much grain is still imported from Bengal, being obtained, as well as sugar and tobacco, in return for native cloths, rock-salt, rhubarb, Thibet goods, mules, and ponies. The religion is Buddhism, the monastic endowments of its priests absorbing a large part of the national property. The government, almost purely ecclesiastical, is in the hands of an oligarchy. The dherma rajah, the nominal head, is treated rather as a god than as a sovereign; while the deb rajah,

the actual head, is controlled in almost everything by a council of eight. Polyandry and polygamy equally conspire to keep down the numbers of the population.

BHOWAN', BHOWANY, BHEWANNEE, or BHIWANI, a t. of British India, in the district of Hissar, Punjab, 55 m. w. of Delhi. The pop. in 1868 was 32,254.

BHU'JI, or BIJI, a small hill-state of India, extending for about 20 m. along the left bank of the Sutlej, and about 7 m. at its greatest breadth. Its pop. is about 20,000. Having been overrun by the Goorkhas, it was, on their expulsion, bestowed by the British government on the present family.

BHURTPORE', the capital of the protected state of the same name in India, is a large t., measuring about 8 m. in circuit, and containing, it is said, about 100,000 inhabitants, in lat. 27° 12' n., and long. 77° 33' east. It is worthy of notice chiefly on account of its two sieges in 1805 and 1825. The strength of the place lay in a mud-wall, which was practically shot-proof, and a surrounding ditch, which might at any time be filled with water from a neighboring lake. On the first occasion, lord Lake's assaults were all baffled by this trench thus flooded. On the second occasion, however, lord Combermere, having arrived in time to cut off the communications of the garrison with the lake above mentioned, overcame his principal difficulty; but even then the mud-wall would yield only to mining.—2. The protected state of B. is situated in lat. 26° 48' to 27° 50 n., and in long. 76° 54' to 77° 49' e., its area being estimated at 1978 sq. miles. The pop. in 1871 was 743,710, giving an average of less than 400 to a sq mile. The country suffers from want of water, having only three perennial streams, of which two, however, are mere rills in the dry season; and yet, in many parts, the soil is rendered highly productive by means of irrigation. The principal crops are grain, cotton, and sugar. In the height of summer, the climate has been compared to the extreme glow of an iron-foundry, the thermometer having been known to stand at 130° F. in the shade. The rajah's revenue is stated at £242,375 a year; and his military force is said to amount to 5400 men of all arms.

BIAF'RA, a kingdom in w. Africa on a bay of the same name between 0° and 5° n., extending but a short distance from the ocean. The chief town is B., situated near the coast.

BIA'FRA, BIGHT OF, a large bay of the Atlantic ocean, on the w. coast of Africa, at the head of the gulf of Guinea, between cape Formosa (which divides it from the Bight of Benin) on the n. and cape Lopez on the south. Its extreme width between these two points is nearly 600 m.; its depth, to the mouth of the old Calabar river, about 250 miles. The northern shores of the Bight, comprehended under the general name of the Calabar coast, and the eastern coast s. of cape St. John, are low and flat. Near old Calabar, the country becomes hilly, and opposite Fernando Po, it rises into the lofty range of the Cameroons. The principal rivers flowing into the Bight are the Niger, or Quorra, the new and old Calabar rivers, the Rio del Rey, the Cameroon, and the Gaboon. The creeks and estuaries of the rivers are generally lined with dense thickets of mangrove, which sometimes grow in the water, their lower branches covered with oysters. In the Bight of B. are the three islands of Fernando Po, St. Thomas, and Prince's Island. The chief European stations on the coast are Duke Town, in Old Calabar, where there is a flourishing missionary station, and Naango, or George's Town, a small commercial town on the estuary of the Gaboon.

BIAL'YSTOK, a fortified t. of western Russia, in the government of Grodno. It is situated on the Bialy, an affluent of the Narew, 45 m. s.w. of Grodno, in lat. 53° 8' n., long. 23° 18' east. B. is well built; lime-trees border several of the streets, and give it a very pleasant aspect. It has a palace and park, now belonging to the municipality, but formerly belonging to the counts of Braniski, and called the "Versailles of Poland," a commodious market, and several churches. It has manufactures of woolens, hats, leather, soap, tallow, etc. Pop. '67, 16,985.

BIA'NA, a t. of India, in the Rajpoot state Bhurtpore. It was once a place of much greater importance than it now is, and was one of the most famous forts in India. The town contains many temples, and the whole ridge of the hill is covered with the remains of large buildings. A high pillar of stone called Bhim Lat, or the *staff of Bhim*, is conspicuous over a wide extent of country.

BIANCAVILLA', a t. of Sicily, in the province of and about 14 m. n.w. of the city of Catania. It is about 10 m. distant from Mt. Etna, on the s.w. declivity of which mountain it is situated. It has a trade in grain, cotton, and silk. Pop. 12,500.

BIANCHI'NI, FRANCESCO, celebrated for his antiquarian and astronomical investigations, was b. Dec. 13, 1662, at Verona, where he received his early education in the Jesuits' college. At Padua he studied theology, mathematics, and above all, botany; and then proceeded to Rome, where he became intimate with the most distinguished *savans* of the day, and devoted himself to the study of jurisprudence and foreign languages. Alexander VIII. bestowed upon him a rich benefice, and Clement XI. appointed him secretary to the commission for reforming the calendar. B. was employed to draw a meridian line in the church of Santa Maria degli Angeli, in Rome, which he successfully accomplished. After traveling through France, Holland, and

England, he returned to Italy, with the design of drawing a meridian line from the Adriatic to the Mediterranean like that drawn by Cassini across France. The operations connected with this project occupied him eight years; but a variety of other labors, as well as want of means, prevented its completion. Besides several memoirs and dissertations on antiquarian and astronomical subjects, we may mention his *Istoria Universale Provata coi Monumenti e Figurata coi Simboli degli Antichi* (Rome, 1694), and his fine edition of the work of Anastasius, *De Vitis Romanorum Pontificum*, which was completed by his nephew Giuseppe B. (4 vols., Rome, 1718–34). B. died in Mar. 1729, and a monument was erected to his memory in the cathedral of Verona.

BIARD, AUGUSTE FRANÇOIS, a French painter, known in almost every department of his art, but chiefly distinguished for his animated and often comical representations of ordinary life and manners (*peinture de genre*). B.'s merits, and the school to which he belongs, will be sufficiently understood when we mention that his countrymen have styled him the Paul de Kock of painting! He was born at Lyon in 1800, and was at first destined for the church; but subsequently educated at the school of art of his native city. He traveled in early life in Malta, Cyprus, Syria, and Egypt, where he made sketches, and stored his memory with images which he used in after years. In 1839, he visited Greenland and Spitzbergen, and of this journey one of the fruits was his famous picture of a battle with polar bears. In 1859 he visited Mexico. The first picture which gained him distinction was his "Babes in the Wood" (1828); and one of his best is the "Beggar's Family," exhibited in 1836. His picture, "Les Comediens Ambulants," is in the Luxembourg. Many continental galleries possess examples of B.'s pictures, and in England they have always been much sought after.

BIARRITZ, a maritime village of France, in the department of the Basses-Pyrénées, about 5 m. s.w. of Bayonne. The late emperor and the empress, attracted by its pleasant situation and salubrity, latterly made it a summer residence; and the presence of the court of course tended to increase greatly the fame of its baths and singular grottoes. Pop. '76, 3348.

BIAS, one of the seven sages of Greece, lived in the time of the Lydian king Alyattes, and his son, Crœsus, about 570 B.C. He was generally employed as a political and legal adviser in difficult questions. At the overthrow of Crœsus, when the Ionians dreaded an invasion by Cyrus, they were advised by B. to take their personal property and colonize Sardinia; but this advice was rejected, and the Ionians, after a vain defense, were subjugated by the generals of Cyrus. When the people of Priene—the birth-place of B.—were making preparations to escape from their besieged city, B., in reply to one who asked why he was not occupied like other citizens, employed the words which have become a Latin proverb, *Omnia mea mecum porto*, "I carry all my goods with me."—Orelli, *Opuscula Græcorum Veterum*, etc., 1819.

BIÁS, one of the five streams of the Punjáb, India, rising in the Bhotang pass, 13,000 ft. above sea-level. It traverses the Kubu valley for 75 m., thence w. and s. to the Punjáb plains, and joins the Sutlej after a course of 350 miles. The B. ran in another bed about a century ago, and emptied into the Multán. The natives say its course was changed in 1750.

BIB, POUT, or WHITING POUT, *Gadus luscus* or *Morrhua lusca*), a fish of the same genus with the cod (q.v.) and haddock (q.v.), pretty common on many parts of the British coast, found also on those of Norway, Sweden, Greenland, etc. It is seldom more than a foot long, but remarkably differs from all other British fishes of the same family (*gadidæ*, q.v.) in the great depth of its body, which equals at least one-fourth of the entire length. The back is arched, and the nape exhibits a rather sharp ridge. The eyes and other parts of the head are invested with a singular loose membrane, which the fish can inflate at pleasure. There is a dark spot at the origin of each of the pectoral fins, as in the whiting (q.v.) .The names bib and pout, both originally local English names, were at one time supposed to belong to distinct species (called *G. lusca* and *G. barbata*), but it appears now to be pretty certain that these are really one. In Scotland, this fish is generally called *brassy*. It is well known in the London market, is in best condition in Nov. and Dec., and is much esteemed for the table.

BIBB, a co. in Alabama, on the Big and Little Cahawbas, reached by the Alabama and Chattanooga railroad; 520 sq.m.; pop. '80, 9,487—3,600 colored. It is hilly and fertile. Iron and coal are abundant. Co. seat, Centreville.

BIBB, a co. in Georgia, on the Ocmulgee; traversed by the Central Georgia railroad; 250 sq.m.; pop. '70, 21,225—11,424 colored; in '80, 27,146 It is uneven, and not very fertile; productions, corn, cotton, and sweet potatoes. Co. seat, Macon.

BIBBIE'NA, FERDINANDO GALLI DA, 1657–1743; an Italian painter and architect who first put movable scenery on the stage. He was employed by Charles VI. to conduct triumphal processions, then much in vogue in Europe. He wrote on architecture and the theory of perspective.

BIBER, GEORGE EVERARD, D.D., b. 1801; an English author and clergyman, concerned with Pestalozzi's schools at Yverdun, and author of a biography of that eminent

teacher. He became a British subject in 1839, and is a curate. He has been active in church affairs; was for some years editor of *John Bull*, and has published *The Standard of Catholicity, Sermons, Bishop Bloomfield and His Times, The Value of the Established Church to the Nation*, and *Robbing Churches is Robbing God*.

BI'BERACH, a t. of Würtemberg, in the circle of the Danube. It is situated on the Reiss, in the charming valley of the same name, about 23 m. s.s.w. of Ulm; and is surrounded by portions of the old ramparts flanked with towers. It has manufactures of machinery, artificial flowers, leather, children's toys, etc. Pop. '75, 7376. In Oct., 1796, Moreau won a great victory over the Austrian gen. Latour at B., the latter losing 4000 prisoners and 18 pieces of cannon. Here also, in 1800, Saint Cyr defeated the Austrian gen. Kray. B. fell into the possession of Baden in 1802, but four years afterwards, was ceded to Würtemberg. Wieland the poet was born in the immediate vicinity.

BI'BERICH, a village in the province of Hesse-Nassau, on the right bank of the Rhine, and about 4 m. from Wiesbaden, is noted for its splendid palace. The views of the river-scenery from B. are unrivaled. Pop., including Mosbach, '75, 7692.

BIBES'CO, GEORGE DEMETRIUS, Prince, b. 1804; a statesman of Wallachia who in 1842 aided in the overthrow of Ghika, and succeeded him as ruler, but was driven out by the revolutionary movements of 1848. In 1862, he was elected to the Roumanian parliament, but declined to serve.

BIBIRI, BIBIRI BARK, and BIBIRINE. See GREENHEART.

BIBLE (Gr. *Ta Biblia*, "The Books"—see BOOK) is the name given by Chrysostom in the 4th c. to that collection of sacred writings recognized by Christians as the documents of their divinely revealed religion. Both as regards language and contents, they are divided into two parts—the Old and New Testament, or rather, the Old and New Covenant; for the word *testamentum* is only a translation into the later Latinity of the 2d c. of the Greek *diatheke*, "covenant." The history of the Old Testament is connected with that of the new by a series of writings not received by Protestants as canonical, and collectively styled the *Apocrypha* (q.v.).

The OLD TESTAMENT is a collection of 39 books, written partly in the Hebrew and partly in the Chaldaic language, and containing all the remains of Hebrew-Chaldaic literature down to the middle of the 2d c. B.C. By an artificial arrangement under the letters of the Hebrew alphabet, the number of books has been limited among the Jews to 22. These writings were spoken of in the time of Christ, and for some indefinite period before his time, as *graphé*, Scripture, or Holy Scripture, or, as "the Law and the Prophets." Sometimes the Psalms and the remaining holy writings (*hagiographa*) are distinctively noticed. The *usus loquendi* of the New Testament (Matt. xi. 13, xxii. 40; Acts xiii. 15; Luke xxiv. 44, etc.) is evidence of this. The Law comprised the Pentateuch, or the first five books. The Prophets were subdivided into earlier and later: the former including the books of Joshua, Judges, Samuel, and Kings; and the latter containing the three great prophets, Isaiah, Jeremiah, and Ezekiel—as well as the twelve minor prophets. The third division of the Old Testament embraced the hagiographa, consisting of the books of Job, Proverbs, Psalms, the Song of Solomon, Ecclesiastes, Ruth, Lamentations, and Esther, together with the books of Daniel, Ezra, Nehemiah, and 1 and 2 Chronicles. With regard to the order of these several books, the Alexandrine translation, the fathers of the church, and Luther, on one side, differ from the Jews; again, among the Jews, the Talmudists differ from the Masoretes, while a difference is also found between Spanish and German MSS. Hence have sprung the different arrangements of the books of the Old Testament.

The Septuagint is generally adduced in proof of the existence of these books in a collected form as early as 285 B.C., but an examination of the Aristean fiction (see ARISTEAS and SEPTUAGINT) is sufficient to show that at that period no more than the Pentateuch was translated into Hellenistic Greek. The earliest indubitable notice is found in the prologue to the Alexandrine translation of the book of Jesus, son of Sirach, written by his grandson probably about 130 B.C., which demonstrates that the Law and the Prophets then existed in a collective form; but this language does not prove that the third division was then concluded, though neither does it disprove it. This conclusion is first definitely ascertained from the catalogue given by Josephus, who flourished after the middle of the 1st c. of the Christian era, while Philo, who flourished 41 A.D., quotes casually from nearly the whole of them.

As regards the genuineness and authenticity of the Old Testament, there has been much discussion in modern times. The generally received opinion is, that the various books were *originally* written wholly or chiefly by the persons whose names are affixed to them, except Judges (Samuel), Ruth (Samuel), Esther (Mordecai), Kings and Chronicles (Ezra and Jeremiah), and perhaps Job (Moses?); but that these MSS. having perished in the destruction of the first temple, when Nebuchadnezzar took Jerusalem, the members of the great synagogue (q.v.)—which included Ezra, Nehemiah, Haggai, Zechariah, Malachi, and afterwards Simon the Just—50 years after the building of the second temple, acting in accordance with a divine commission, rewrote the Old Testament; or rather made a recension of other existing copies, to which were subsequently added the

books of Ezra and Nehemiah. Thus the canon was concluded. This was the belief of the Jews themselves at a later period; the *Pirke Aboth* (Sayings of the Fathers), one of the oldest books of the Talmud, as well as other Jewish records, distinctly assert it. It is, however, simply a tradition, and though possibly true, is necessarily incapable either of demonstration or refutation. In the absence of any direct and conclusive evidence on this point, the contents of the Old Testament have been minutely analyzed by modern German critics, who have attempted to show that they bear internal evidence of having been composed generally at a later period than is ordinarily believed. Their work has now been taken up by English, Dutch, and French scholars, of whom perhaps the most notable are Colenso (see NATAL) and Kuenen, and prosecuted with keenness and vigor.

The Samaritans, who were at enmity with the Jews, recognized only the five books of Moses, and a corrupt version of the book of Joshua, as canonical. On the other side, the Egyptian Jews, for whom the Alexandrine version of the Old Testament was made, received as canonical several writings which were rejected, or subordinated as apocryphal (see Apocrypha), by the Jews of Palestine. The primitive church, in the period which elapsed before the canon of the New Testament was completed, referred to the Old Testament for proof of doctrines; but, on account of the prevalent ignorance of the Hebrew and Chaldee languages among the early Christians, the Alexandrine Greek version was the authority employed. As this included the apocryphal books, rejected by the Jews of Palestine, the earliest Christian fathers made the same use of these writings as of the others; but the growth of criticism during the next two centuries was fatal to their reputation, or at least to their authority. We do not find, however, that they were formally designated "apocryphal" until the time of Jerome (5th c.), though the Greek church, in the previous century, had approximated to this mode of viewing them, by affirming them to be *not* canonical, but only edifying, and also by issuing lists or catalogues of those books which were recognized as canonical. In the Latin church, on the other hand, these writings were received as canonical after the 4th c., though Jerome, Hilarius, Rufinus, and Junilius wished to distinguish them from the canonical books by the name of *libri ecclesiastici*. The Protestants, at the reformation, returned to the distinction originally made by the Palestinian Jews between the Hebrew scriptures of the Old Testament and the apocryphal works included in the Alexandrine version and the Latin Vulgate. Luther, in his translation of the B., included the Apocrypha as "books not to be placed on a level with the canonical scriptures; but profitable for reading." The council of Trent, which seemed to think that the only safe path for Catholicism to pursue was the exact opposite of that on which Protestantism moved, declared that whoever denied the canonical character of the Apocrypha should be *anathema*.

The NEW TESTAMENT, or the collection of canonical scriptures containing the history and doctrines of Christianity, may be divided into three chief sections: 1. The historical books, or the four gospels, and the Acts of the Apostles. 2. The didactic and pastoral writings, which include the epistles of Paul to the Romans, Corinthians, Galatians, Ephesians, Philippians, Colossians, Thessalonians, Timothy, Titus, and Philemon, the Epistle to the Hebrews (which does not state the writer's name), the two epistles of Peter, the three epistles of John, the epistles of James and Jude. 3. The prophetical section, consisting only of one book, the Apocalypse, or Revelation of St. John the Divine. The primitive Christians referred for proof of doctrine, etc., only, so far as we are aware, to the Old Testament, and quotations from it by the apostolic fathers are numerous enough; but we find few clear and certain references to the didactic portions of the New Testament. The reason of this appears to be, that the lapse of time had hallowed the Old Testament, and given to it that superior authority which springs from venerable age. The generation which immediately succeeded that of the apostles—and indeed, so far as we can see, the same may be said of the apostles themselves—did not consider the apostolic writings of equal importance *as writings* with the sacred books of the Old Testament. Besides, most of the epistles were of little use in controversy, for the earliest heretics denied the apostleship of St. Paul; while both parties admitted the authority of the Septuagint, and found in it their common weapons of argument. Nevertheless, we occasionally find references to the didactic portions of the New Testament, such as those to Romans, 1st Corinthians, Ephesians, Hebrews, and James, in Clemens Romanus; to 1st Corinthians and Ephesians, in Ignatius; to Romans, 1st Corinthians, 2d Corinthians, Galatians, Philippians, 1st Timothy, 2d Timothy, 1st Peter, and 1st John, in Polycarp. Still more uncertain are the references of the apostolic fathers to the gospels. The notices found in Barnabas, Clemens Romanus, Ignatius, and Polycarp are only sufficient to indicate that all the great facts of Christ's life were known to the churches, and that the doctrinal significance of these had begun to be realized. They do not, however, demonstrate the existence of written gospels, but they prove that Christianity rests on a historic basis. Their silence in relation to the written gospels now constituting a portion of the canon of the New Testament, is at first sight singular; but when we reflect that the facts of the Saviour's life and teaching were apparently quite familiar to the churches—so familiar, indeed, that no explanation was needed in alluding to them—we see that the necessity of the apostolic fathers quoting from the evangelists ceases. It is contended that any specific quotations would have been a work of supererogation; whereas, in the case of the didactic epistles, which were written originally for the benefit of particular churches, and conditioned by their special

circumstances, and the contents of which, therefore, could not be so well or widely known, quotations or allusions might more naturally be looked for. But evidence of this *negative* character for the existence of the evangelical records, however probable, is very uncertain, and its uncertainty is increased by the use made of writings which, at a later period, were rejected as apocryphal. First, in the second half of the 2d c., more distinct references to the gospels are found in Papias (died 163), in Justin Martyr (died 166 A.D.), in his pupil Tatian (died 176), in Athenagoras (died 180), and in Theophilus, who wrote about the year 180. None of these writers, however, name the authors from whom they quote, though Papias—the earliest, but not the most trustworthy of them—bears direct and minute testimony to the existence of gospels by St. Matthew, St. Mark, St. John, the catholic epistles, and the Apocalypse, whence it has been concluded that the authenticity of the apostolic memoirs was not then settled, and perhaps not even investigated; but anonymous quotation seems to have been a characteristic carelessness of the time, for of this kind are 117 of Justin Martyr's references to the Old Testament. The great fact on which a constructive Christian criticism leans in regard to the evidence of these writers is, that they do not speak of the gospels or apostolic memoirs as things which had only recently made their appearance, but as well known and long established. Justin even states that the "apostolic memoirs" were regularly read in the churches for the edification of believers—a fact which clearly indicates their superior sanctity and general reception. The Tübingen school contend that these apostolic memoirs could not have been the canonical gospels, but must rather have been the primitive evangelical records out of which the canonical gospels were formed; but it cannot be said that the criticism of Baur and his followers, in spite of its profound and searching character, has seriously imperiled the claim to apostolic antiquity put forth on behalf of the New Testament scriptures.

Nevertheless, the idea of a strict and pure New Testament canon (see CANON) is not discernible in the church in Justin Martyr's time. There is no positive evidence in favor of its existence; but this is not to be wondered at, for the consciousness of freedom in the Holy Spirit, which penetrated the Christians of the 1st c.; the opposition of what in continental theology are termed the Petrine and Pauline (q.v.), i.e., the Judaizing and anti-Judaizing parties, which does unquestionably appear to have existed; the still living tradition of the apostles; the difficulty of diffusing apostolic writings sent only to particular churches; the absence of criticism; the vacillation in determining the point where the apostolic men ceased; the use in the worship of God of the Old Testament, and, in particular churches, of casual Christian writings not now looked upon as canonical: all these causes together operated in hindering, till the middle of the 2d c., a formal collection of New Testament writings of any compass or critical value, though it seems quite clear that they existed separately, and were regarded as the most authoritative records of the new dispensation. The earliest trace of such a collection (the ten Pauline epistles without the pastoral epistles) appears after the middle of the 2d c. in opposition to that gnostic perversion of primitive Christianity which had been introduced by Marcion of Pontus. The *Muratorian Canon* in the west, and the *Peshito* (q.v.) in the east, both belonging to this period, which has been called the "age of the apologists," furnish important evidence in regard to the New Testament canon, for both refer to nearly every book now received as authoritative, the exceptions being, in the former, the Epistle of James, the Epistle to the Hebrews, and 2 Peter; in the latter, Jude, 2 Peter, 2 and 3 John, and the Apocalypse. In the close of the 2d, and in the beginning of the 3d c., Irenæus, Clemens Alexandrinus, and Tertullian bear testimony to the recognition of the four gospels, the Acts of the Apostles, the thirteen Pauline epistles, the 1st Epistle of Peter, the 1st Epistle of John, and the Apocalypse, as canonical writings. But they do even more than bear testimony to their recognition—they appeal to antiquity for proof of the authenticity of the books which they used as Christian Scriptures. On this point, Tertullian is especially precise, and his most convincing argument on behalf of the "surety of the gospels" is, that "the very heretics bear witness to them." They did not, it is admitted, acknowledge the whole of the New Testament canon, but this is explicable on the hypothesis, which is justified by investigation, that the portions rejected were those that seemed alien to their own opinions. Two distinct collections of writings are now noticed—the *Instrumentum Evangelicum*, containing the four gospels; and the *Instrumentum Apostolicum*, containing the Acts of the Apostles, along with the Pauline and other epistles. Respecting several parts of the New Testament canon, differences of opinion prevailed in early times, nor was the war of criticism closed until the 6th c., for considerable difference of opinion existed in regard to the value of the testimony of the early apologetic authors. Origen doubted the authority of the Epistle to the Hebrews, of the Epistle of James, of Jude, of the 2d of Peter, and the 2d and 3d of John; while, at the same time, he was disposed to recognize as canonical certain apocryphal scriptures, such as those of Hermas and Barnabas, which were decidedly rejected by the church. The Apocalypse was treated as a dubious part of the canon down to the 7th century. The learned and circumspect father, Eusebius, in the 4th c., in a passage of his *Church History*, distinguishes three classes of the New Testament Scriptures: 1. Universally received Scriptures (*homologoumena*), the four gospels, the Acts of the Apostles, the fourteen Pauline epistles, the 1st Epistle of John, the 1st of Peter, and, with a certain reservation, the Apocalypse of John. 2. Scriptures not uni-

versally received, or not received at all. These he calls "disputed" (*antilegomena*), and subdivides them into such as were generally known and approved by most—viz., the epistles of James, Jude, 2 Peter, 2 and 3 John; and such as were "spurious" (*notha*)—viz., the Acts of Paul, the Shepherd, the Apocalypse of Peter, the Epistle of Barnabas, the Institutes of the Apostles, and the Gospel of the Hebrews. 3. Heretical forgeries, such as the gospels of Peter, Thomas, Matthias, which Eusebius pronounces to be "altogether absurd and impious."

The western church, which was more conservative and less critical than the eastern church, completed the canon with greater rapidity. Although the eastern council of Laodicea (360–364), in determining the canon of the New Testament, excluded the Apocalypse, the western synods of Hippo-Regius (393) Carthage (397), the Roman bishop, Innocent I. (in the beginning of the 5th c.), and the *Concilium Romanum* under Gelasius I. (494), recognized the entire canon of the New Testament as we find it in the present day. The doubts entertained by individuals respecting some parts of the canon had become exceptional and unimportant at the close of the 7th century. Owing to the want of Greek scholarship, as also, perhaps, to the growing idea of an infallible church papacy, there was no criticism worthy of the name during the middle ages. Doubts, therefore, respecting the Epistle to the Hebrews and the epistles of James and Jude were first revived, after a long quietude, at the time of the reformation. Erasmus denied the apostolic origin of the Epistle to the Hebrews, 2 Peter, and the Apocalypse. Luther ventured to declare the Epistle to the Hebrews and the Apocalypse "apocryphal." Melanchthon, Gerhard, and Chemnitz went in the same direction, and even Calvin denied the Pauline authorship of the Epistle to the Hebrews. But biblical criticism, for reasons both political and ecclesiastical, soon became dormant, and so remained for nearly two centuries, when it was revived by a liberal Catholic writer, Richard Simon (died 1712), who first conceived the plan of "an historico-critical introduction" to the B.; afterwards, the labors of Lowth, Semler, Herder, Griesbach, Michaelis, Eichhorn, and others, gave a new impulse to scriptural exegesis. In Germany, we may name among writers on the conservative and orthodox side, the Catholic divines Jahn and Hug, with the Protestant writers, Hengstenberg, Hävernick, Guerike, Delitzsch, and Caspari: on the other side, Berthold, De Wette, Credner, Reuss: and since the publication of the *Life of Jesus* by Strauss, the "New Tübingen school," with F. Baur (q.v.) at its head, has questioned the authenticity and apostolical antiquity of all the New Testament Scriptures, except the four larger epistles of Paul—to the Romans, the Corinthians (1st and 2d), and the Galatians. The critical labors of Ewald (especially on the Old Testament), of Hilgenfeld, and of Keim have exerted important influence.

But, as might have been expected, the effects of the strife could not always remain confined to Germany. They have been felt more or less over all Protestant countries—England, Holland, and America—and even Catholic France, which has no theology to contend for, shows the influence of the new movement. Renan (q.v.), who in his *Vie de Jésus* excited a vivid sensation, has followed up his first work by a series of volumes on the early history of Christianity. In England, during the 18th c., several valuable apologetic works were published, such as Lardner's *Credibility of the Gospel History*, and Paley's *Horæ Paulinæ*. In the early part of the 19th c. appeared Horne's *Introduction to the Study of the Scriptures*, which has been frequently reprinted. Since then, Tregelles, Davidson, Westcott, and numerous other scholars, have entered the field; and it is not too much to affirm, that, among the more earnest class of British theologians, there exists at this moment a keener spirit of impartial inquiry, as regards the foundations of biblical criticism, than Britain has ever previously witnessed. The practical tendencies of the Anglo-Saxon mind long restrained it from interfering in what seemed to be a mere maze of unprofitable speculation; but now that its deep and vital relations to the groundwork of men's actual and possible beliefs have begun to be felt, these very practical tendencies are manifestly asserting themselves, and we may confidently anticipate that a large measure of attention on the part both of the clergy and laity will soon be given to this most important of all branches of knowledge.

EDITIONS OF THE BIBLE: HISTORY OF THE TEXT.—As both the Old and the New Testament were written in ancient languages, and transcribed in times when philological criticism hardly existed, the examination and comparison of various editions, with a view to obtain the greatest possible purity of text, forms an important part of theological study.

Text of the Old Testament.—The first duty of an impartial critic of this question is to lay aside both of the extreme and untenable opinions regarding the Hebrew text of the Old Testament, viz.—1st, that it has come down to us in an absolutely faultless condition, by miraculous preservation; and 2d, that it has been willfully and unscrupulously falsified by the Jews. That there are erroneous readings, nobody doubts. The real task devolving on a student of this branch of theological science is to explain these on natural principles, and, by collating the various recensions, to endeavor to obtain a pure text, or as close an approximation to that as may be possible. The following is a tolerably complete classification of the causes of errors. 1. Errors arising from *imperfect sight* or *occasional inattentiveness;* as when transcribers substituted one letter for another similar in appearance, transposed letters, words, and sentences, and omitted the same; of which there are various examples. 2. Errors arising from *imperfect hearing*, of which

there are not many examples. 3. Errors arising from *defective memory;* as when a transcriber fancied that he knew certain words, phrases, or clauses, on account of their having occurred before; of these there are occasional examples. 4. Errors arising from *defective judgment;* as when words were wrongly divided, or abbreviations wrongly resolved; also from the *custodes linearum* (i.e., the letters which filled up the occasional vacant space at the end of lines) and marginal remarks being sometimes incorporated with the text. These not unfrequently happen. 5. Errors arising from a *well-meant desire* on the part of the transcriber to explain or amend a text, really or apparently obscure. In this respect the Samaritans are greatly to blame. A very knotty point is the condition of the text before and at the close of the canon. The opinion of Eichhorn, De Wette, and others is, that while the books circulated singly in a sphere of uncertain authority, they were greatly corrupted; in support of which, considerable evidence is adduced, but still the probabilities are, on the whole, against such a supposition, and it is better to suppose that the conflicting accounts of the same events which are to be met with, especially in the historical books, arise not from the carelessness or corruptions of copyists, but rather from the original authors or compilers having consulted differing documents.

From recent investigations, it appears clear that the strict dogmatic Jews of Palestine and Babylon were generally far more careful in their preservation of sacred records than the Samaritans and the Alexandrines, the latter of whom were remarkable for their free, philosophizing, non-textual spirit. In the schools of learning in Jerusalem at the time of Christ, presided over by Hillel, who had come from Babylon, and Shammai, and in those which flourished elsewhere in Palestine, after the fall of the metropolis, for instance, at Lydda, Cæsarea, Tiberias, etc., as also in the academies of Sora, Pumpeditha, and Nahardea, near the Euphrates, at a later period, the text of the Old Testament was defined with great care, first by the Talmudists, who seem to have adhered very closely to the ancient text, and after the completion of the Talmud at the close of the 5th c. by the *Masorites.* See MASSORAH. This care was at first bestowed only on the consonants of the Hebrew text. The Masoretic vowel system, which sprang from that already existing among the Syrians and Arabians, was developed from the 7th to the 10th centuries at Tiberias. By the 11th c. it appears to have been completed, while the Spanish rabbis of the next century seem ignorant of its then recent origin. (For proof of this, see Davidson's *Text of the Old Testament Considered,* 1856.) After the 11th c., the Masoretic text, with its perfected system of vowels and accents, became the standard authority among Jewish scholars. The comparative values of the different readings in the various MSS. had by that time been carefully determined, and the chief business of copyists, henceforth, was to make faithful transcripts.

The earliest printed editions of the Hebrew B. bear a close resemblance to the MSS. "They are without titles at the commencement, have appendixes, are printed on parchment with broad margin, and large ill-shaped type, the *initial* letters being commonly ornamented either with wood-cut engravings or by the pen. These letters, however, are often absent. With vowels, the editions in question are very imperfectly supplied. Separate parts of the B. were first printed." ThePsalms appeared in 1477, probably at Bologna; the Pentateuch at Bologna in 1482; the Prophets in 1486; the Hagiographa in 1487. To most of these were subjoined the rabbinical commentary of Kimchi. The whole of the Old Testament appeared in small folio at Soncino, 1488, and appears to have been followed by the edition of Brescia (1494), which was used by Luther in his translation of the Old Testament. The *Biblia Polyglotta Complutensia* (1514–17), the *Biblia Rabbinica* of Bomberg, edited by Rabbi Jacob-Ben-Chajin (Venice, 1525–26), which has been adopted in most of the subsequent editions—the Antwerp *Biblia Polyglotta* (8 vols., 1569–72), also the editions by Hutterus (Hamburg, 1587, and frequently reprinted), Buxtorf (Basel, 1611), and especially that by Jos. Athias (Amsterdam, 1661–67)—all these are celebrated, and have supplied the basis of later editions by Simon, Hahn, Theile, and others. In the 17th c., a vehement controversy arose regarding the integrity of the Hebrew text; one party maintained that the Masoretic text was greatly corrupted, and contrasted it unfavorably with that of the Samaritan Pentateuch. The chief advocates of this view were Vossius, Whiston, Morin, and Capellus. On the other hand, Buxtorf, Arnold Bootius, Wasmuth, and others, defended the absolute purity of the Masoretic text, even to the inspiration of the vowel-points, which Buxtorf, in the preface of his grandfather's *Tiberias,* gravely asserts to have been first invented by Ezra. This controversy had at least one good result. It led to an extensive examination of Hebrew MSS. in the next century. Kennicott collated 630, 258 throughout, the rest in part; De Rossi, 751, of which all but 17 were collated for the first time. Many still remain uncollated. The result of this elaborate investigation has been to convince scholars that the Masoretic text is substantially correct. All known codices confirm it; the oldest of the professedly literal versions, as well as the Targums of the time of Christ, furnish similar satisfactory evidence; and when we consider the *bibliolatrous* tendencies of the Jews *after* their return from exile, whatever may have been the case before, we may safely conclude that we now possess the text of the Old Testament much in the same condition as it was at the close of the canon.

At first, there were no intervening spaces between Hebrew words; afterwards, small intervals appear to have been occasionally allowed. With the introduction of the *square*

character, the use of small interstices to separate words became general. The Talmud prescribes how much space should be between words in sacred MSS. designed for the synagogue. Various divisions according to the sense were also introduced at an early period. In the Pentateuch there were two, termed respectively *open* and *closed*. The former were intended to mark a change in the matter of the text; the latter, slight changes in the sense. Of these, the Pentateuch contained 669, named *parshioth* (sections). This division is probably as old, or nearly so, as the practice of reading the Law. It is found in the Talmud, while the division into 54 *great parshioth* is first found in the Massorah, and is not observed in the rolls of the synagogues. The poetical books were also subjected, from a very early period, to a stichometrical division, according to the peculiarities of Hebrew versification. In order to facilitate the reading and understanding of the prose books, a division into logical periods was also made, which is mentioned in the *Mishna* (q.v.), while in the *Gemara* (q.v.) its authorship is ascribed to Moses. From it sprang our present division of the Scriptures into verses. It is highly probable that these divisions were long handed down orally. Our present division of the Old Testament into chapters is a later invention, and, though accepted by the Jews, is of Christian origin: it may be dated as far back as the 13th c., some assigning it to Cardinal Hugo, others to Stephen Langton, archbishop of Canterbury. It was first employed in a concordance to the Vulgate, whence it was borrowed by Rabbin Nathan in the 15th c., who made a similar concordance to the Hebrew Bible. Nathan's divisions are found in Bomberg's Hebrew B. of 1518. Verses were first introduced into editions of the Hebrew B. by Athias of Amsterdam, 1661, but were employed in the Vulgate as early as 1558. The first *English* B. divided into verses was published at Geneva in 1560.

New Testament.—The original MSS. of the New Testament were probably all written on papyrus, the cheapest, but least durable material that could be obtained for the purpose. It was therefore impossible, considering the constant handling to which the documents must have been subjected by the eager converts, that they could have lasted for any length of time. Indeed no authentic notices of them have come down to us, and it is a curious fact that, in the controversies of the 2d c., no appeal is made to the apostolic originals. But the number of copies was very great. The text of these, however, did not always agree. Variations originated, to a considerable extent, from the same causes as operated in the case of the Old Testament, viz., imperfect vision or hearing, misunderstanding, carelessness, or an uncritical judgment on the part of transcribers; but it is natural to suppose that, on account of the greater freedom of spirit and thought which characterized primitive Christianity, compared with Judaism, a latitude of conviction in regard to the value of the *letter* of Scripture, also influenced the churches. The *idea* of inspiration (q.v.), it is now admitted by the most enlightened theologians, was progressively developed. In the earliest ages it did not exist in any dogmatic form whatever. Christians were content to believe that the evangelists and apostles spoke *truth*, by the help of the Holy Spirit, without perplexing themselves with the question, whether the words were purely divine or purely human in their origin. They had a gospel to preach, and a world to convert, and were therefore not in a mood to discuss mechanical notions. This also must have operated in producing the textual variations referred to, many of which are of such a nature as to clearly prove that the commentators or transcribers thought themselves at liberty to alter or improve the expression. Nor must we overlook the fact, that the different culture and tendencies of the eastern and western churches also caused very considerable changes. Modern criticism reckons no less than 80,000 variations in the existing MSS. Nevertheless, one fact stands out, solid and imperishable, amid all the tiny fluctuations of verbal criticism, viz., that, with one or two exceptions, no material difference exists, or in all probability ever did exist, in New Testament MSS. The *general* Christian consciousness, which was the real guardian of their integrity, had been grounded too deeply in the facts, doctrines, and ethics of a historic Christianity to follow in the wake of sectarian or heretical modifications of the truth. It instinctively turned, as it were, from a sense of affinity to those apostolic records, the tone of which most closely corresponded to its own spiritual character and development, and thus unconsciously prevented any incongruous changes from being effected in the mass of MSS. Of these MSS., upwards of 1400 are known to scholars, and have been collated, and no essential discrepancy has been detected. Of course, it can be urged that all the MSS. belong to a period when the church had gathered itself up into two great wholes—the Latin and Greek, and when, therefore, a general conformity in MSS., as in other things, is only to be expected; but the fragments which are found in the earliest church fathers exhibit substantially, though not verbally, the same text, and we may therefore fairly infer that this unintentional harmony in part argues the general harmony of the earlier and later MSS.

Some slight attempts seem to have been made, during the early history of the church, to obtain a correct text. One Lucian, a presbyter of Antioch, and Hesychius, an Egyptian bishop, are said by Jerome to have undertaken a recension of the New Testament, and both Origen and Jerome himself were of considerable service in this respect. It is to modern criticism, however, that we owe almost everything in regard to the regulation of the text. Bengel and Semler first started the idea of arranging the MSS. of the New Testament into *families* or *classes*. After these came Griesbach, who, following out the idea, propounded his famous threefold division of the MSS. into Western, Alexandrian,

and Byzantine. The first two he considers the oldest; the third, a corrupt mixture of both. Griesbach himself preferred the Alexandrian: he believed that the Byzantine transcribers had taken great liberties with the text, and held that a few Alexandrian MSS. outweighed, in critical value, a large number of the other. The accuracy of Griesbach's division has subsequently been questioned by many eminent German scholars, each of whom has in turn favored the world with a theory of his own in regard to the probable value of the various families of MSS. Recently, Lachmann has applied, with excessive strictness, a principle first hinted by Bentley, viz., that no weight ought to be attached to any MSS. except those written in the old or uncial (q.v.) character. The exact value of each manuscript is still a matter of dispute; but a great deal has been done to place the knowledge of the various lines of evidence within the reach of all scholars. Tischendorf carefully examined the most important of the uncial MSS., and published them separately somewhat after the fashion of a fac-simile. He also published a fac-simile of the *Codex Sinaiticus*, which he found in a monastery in Mt. Sinai. Scrivener has collated a considerable number of cursives, and collated again the *Codex Bezæ*. And great attention is being paid to quotations from the fathers. Rönsch, for instance, has given all the quotations from the New Testament in Tertullian, and Tischendorf made large use of them in his last or eighth edition.

The whole of the New Testament was first printed in the Complutensian Polyglott, 1514. From 1516 to 1535, five editions appeared at Basel, under the care of Erasmus, but without any great pretensions to critical accuracy. The subsequent numerous editions were, for the most part, either founded on the editions of Erasmus or on the Complutensian, or on a collation of both. Among these editions we may mention those of Simon de Colines or Colinæus (Paris, 1543), of the elder Stephen (1546, 1549, and 1550), of the younger Stephen (1569). Beza was the first who, by several collations founded on the third edition by Stephens, made any considerable progress in the critical treatment of the text, and thus supplied a basis for the present received text (*textus receptus*), which was first printed by Stephens with the Vulgate and critical annotations at Geneva, 1565; afterwards was frequently reprinted by Elzevir (Leyden, 1624) and others. The labors of the English scholar, Walton, in the London Polyglott (1657), of Fell (Oxford, 1675), and especially Mill (Oxford, 1707), were of great importance for the criticism of the New Testament. Bengal exhibited great tact and acumen in his edition of 1734, Wetstein much industry and care in the editions of 1751–52, as also Semler, 1764. But all these recensions were surpassed in value by the labors of Griesbach (1st ed. 1774; 2d and best ed. 1796–1806). The more recent contributions to the criticism of the New Testament by Scholz, the *Lucubratio Critica* (Basel, 1830), and the critical edition by Rinck (2 vols., Leip. 1830–36), the edition by Lachmann (Berl. 1831), with especial use of oriental MSS., and, subsequently, the labors of Buttmann (1842–50), Tregelles, (1854–63), Tischendorf, (1841–73), and Scrivener (1861), are also worthy of high praise.

Among the MSS. of the New Testament, the oldest are not traced back further than the 4th c., and are written in the so-called *uncial* characters. The modern MSS., dating from the 10th c. downwards, are distinguished by the *cursive* characters in which they are written. The most important MSS. are the *Codex Sinaiticus* (at St. Petersburg), the *Codex Alexandrinus* (in the British museum), *C. Vaticanus* (in the vatican at Rome), *C. Ephræmi* (in the imperial library at Paris—a fac-simile of which was edited by Tischendorf, Leip. 1843), and *C. Cantabrigiensis*, or *C. Bezæ* (given by Beza to the university of Cambridge, a fac-simile being issued by Th. Kipling, 1793). Of these, the *Codex Vaticanus* was long considered to be the oldest, but the discovery of the *Codex Sinaiticus* by Tischendorf at the monastery of St. Catharine, Mt. Sinai, in 1859, has now transferred the honor to that invaluable document, the age of which cannot be older than the middle of the 4th century. A fac-simile of the *Codex Vaticanus*, edited by cardinal Mai, was published at Rome in 1858.

The earliest division of the New Testament into verses of which we read is that made by Euthalius, deacon of Alexandria, 462 A.D. He arranged those words that were related to each other by the sense into *stichoi* or lines. Subsequently, to save space, a colon or point was substituted, until, finally, a complete system of punctuation arose. In the 13th c., as we have already seen, the division into chapters took place, and in the 16th the versicular division was perfected by Stephens. The arguments or contents prefixed to the several chapters are also of modern origin.

B. Versions or Translations.—These may be divided into ancient and modern. The *ancient translations* of the Old Testament from the original Hebrew may be classed as follows: 1. *Greek.*—The earliest of these is the Alexandrine or Septuagint (q.v.), after which come respectively the translations by Aquila (q.v.), Theodotion, and Symmachus. The whole of these, with fragments of others by unknown authors, were given by Origen in his *Hexapla* (q.v.). The *Versio Veneta*, a Greek translation of several books of the Old Testament, made in the 14th c., and preserved in the St. Mark's library, Venice, was published by Villoison at Strasburg, in 1784. Several early versions were also based on the Septuagint; but for that reason do not possess an independent value, being for the most part simply translations of a translation. Among these may be mentioned the old Latin version or *Italic* (q.v.), though the term *Italic* is strictly applicable to the New Testament only, improved by Jerome (382 A.D.): the Syriac, including the *Versio Figurata*, partially preserved and collated by Jacob of Edessa, in the beginning of the 8th c.;

and that by Paul, bishop of Tela (617 A.D.): the *Ethiopic*, made by certain Christians in the 4th c.: the threefold *Egyptian* (3d or 4th c.), one being in the language of lower Egypt, and termed the *Coptic* or *Memphitic;* another in the language of upper Egypt, and termed the *Sahidic* or *Thebaic;* and a third, the *Basmuric*, whose locality is uncertain: the *Armenian*, by Miesrob and his pupils in the 5th c.: the *Georgian*, of the 6th c.: the *Slavonian*, commonly ascribed, but for unsatisfactory reasons, to the missionaries Methodius and Cyrillus in the 9th c.: the *Gothic*, ascribed to Ulphilas, and executed in the 4th c., only some few fragments of which are extant: *lastly*, several Arabic translations of the 10th and 11th centuries.—2. The *Chaldaic translations* or *Targums*. These had an early origin; but, with the exception of those of Onkelos and Ben Uzziel, are unsatisfactory in a critical point of view. See TARGUM.—3. The remarkably literal translation into the Aramaic dialect of the later Samaritans, of the ancient copy of the Pentateuch, possessed by the Samaritans (see SAMARITAN PENTATEUCH).—4. The church translation, known as the *Peshito* (q.v.), received by all the Syriac Christians. It was undoubtedly executed from the original Hebrew text, to which it closely adheres. Several Arabic versions were founded on the *Peshito*.—5. The later Arabic versions, executed during the middle ages, partly from the Hebrew text, and partly from the Samaritan Pentateuch.—6. The Persian translation of the Pentateuch, made by a Jew named Jacob, not earlier than the 9th century.—7. The Latin Vulgate (q.v.), from which a considerable number of fragmentary versions were made into that form of English commonly called Anglo-Saxon, the most noted translators being Adhelm, bishop of Sherborne, and Bede (8th c.); Alfred (9th c.); and Ælfric (10th c.).

Among ancient versions of the New Testament we may notice three in Syriac: the first is the *Peshito*, with a twofold secondary translation of the four gospels into Arabic and Persian. It does not, however, contain 2d Peter, 2d and 3d John, Jude, or the Apocalypse, which at a later period were classed among the *antilegomena*, or disputed books. The second, or *Philoxenian*, prepared in 508 under the direction of Philoxenius, bishop of Hierapolis. It no longer exists, but a counterpart of it does, in the translation made in the following century (616 A.D.) by Thomas of Harkel or Heraclea, the successor of Philoxenius. The best MS. of this version is one which belonged to Ridley, and is now in the archives of the New college, Oxford. It includes all the books of the New Testament excepting the Apocalypse. The style is slavishly literal. It was edited by White, Oxford, 1778. The third, or Jerusalem-Syriac version, preserved in a Vatican MS., and, according to the subscription annexed to it, executed at Antioch in 1031. With the above Syriac version we may class the Ethiopic translation; the Egyptian threefold version, made probably in the latter part of the 3d c., and of considerable critical value; the Armenian, Georgian, Persian, and Coptic-Arabic. Besides these may be mentioned the old Italic; the Vulgate by Jerome; the Gothic translation by Ulphilas (about the middle of the 4th c.), of which the most famous MS. is preserved in the library of Upsal, in Sweden (this has only the four gospels, and not even these in perfect condition); the various Anglo-Saxon versions already mentioned in connection with versions of the Old Testament; and the Slavonic.

Modern Translations.—During the middle ages, when the laity were considered by the priesthood unfit to be intrusted with the B. as a whole, various poetical versions—such as the gospel history, by Otfried von Weissenburg, and the version of Job and of the Psalms by Notker-Labeo (980 A.D.)—served a very important object, and stimulated the desire for more biblical information. As early as 1170, Petrus Waldus caused the New Testament to be translated into Provençal dialect by Etienne d'Anse. This important work was followed by the translations made under Louis the Pious (1227) and Charles the Wise (1380), the B. histories (*Bible ystorieus*) by Guyars of Moulins (1286), the Spanish version under Alfonso V. in the 13th c., the English by Wickliffe, and the Bohemian version of John Huss. After the invention of printing—especially after the latter part of the 15th c.—the harbingers of a new ecclesiastical era appeared in numerous republications of the translated B.—the Bohemian (Prague, 1448); the Italian, by the Benedictine Nic. Malherbi (1471); the French, by Des Moulins (1477–1546); the Dutch (Delf, 1477); the Spanish (1478–1515); but, above all, in the 17 German translations before Luther, of which 5 were printed before 1477, and the remainder in the low German dialect during 1477–1518.

Luther's translation of the B. is universally esteemed by the best German scholars as a masterpiece of genial interpretation. It displays qualities far superior to those ordinarily expected in a translation—deep insight, true sympathy with the tone of the Hebrew Scriptures, and a perfect command of clear, popular language; indeed, every one who can thoroughly appreciate the merits of this great work, will be ready to excuse the boldness of the assertion, that "it is rather a re-writing than a mere translation of the B.," a transfusion of the original spirit into a new language, rather than a mere version of the latter. The New Testament was finished by Luther at Wartburg, and appeared in Sept., 1522. In the following year, the five books of Moses appeared; and, in 1534, the remaining part of the Old Testament canon was completed along with the Apocrypha. With wonderful rapidity this translation was circulated throughout Germany. In the course of forty years, one bookseller, Hans Luft of Wittenberg, sold 100,000 copies; an astonishing number, when we consider the price of books in the 16th century. It was reprinted 38 times in Germany before 1559, and meanwhile the New

Testament had been separately printed in 72 editions. Numerous other translations in Dutch, Swedish, etc., were based upon the work of Luther.

English Translations.—Wycliffe (q.v.) executed a noble version from the Vulgate, but it was long before our country began to print even portions. Long after Germany and other countries had issued vernacular versions of the B., that land continued to sit in darkness. The earliest attempt was a translation of the *seven penitential psalms* in 1505. No doubt, a very considerable number of MSS. circulated among the people; but still we may well ask: "What were these among so many?" Such a question the noble martyr, William Tyndale (q.v.), seems to have put to himself, and bravely he answered it, vowing that "if God would spare his life, ere many years he would cause the boy who driveth the plough to know more of the Scriptures than did all the priests." To accomplish his purpose, he passed over to the continent. Before 1526, he had completed an English translation of the New Testament, which appeared both in quarto and duodecimo. In the beginning of 1526, the volumes were secretly conveyed into England, where they were bought up and burned, which, however, only stimulated Tyndale to greater exertions. Of the admirable character of his translation, we have a sufficient testimony in this fact, that in our present version a very large portion of the New Testament is taken almost *verbatim* from Tyndale's Testament. Tyndale next proceeded to prepare a version of the Old Testament out of the original Hebrew, and in 1530, he published the Pentateuch, and in the following year, the book of Jonah. The first English version of the whole B. was that published by Miles Coverdale, a friend of Tyndale. It is dated 1535, and dedicated to Henry VIII., but where printed, is unknown. It is much inferior to Tyndale's. The next English B. issued was called *Matthew's B.*, from the circumstance that the editor assumed the name of Thomas Matthew, but was simply Tyndale's version revised by his friend John Rogers, who also translated those books in the Old Testament which the martyr had not been able to overtake. It was finished in 1537, and Cranmer obtained for it the patronage of Henry, though that monarch had persecuted Tyndale some years before. Matthew's B. soon superseded Coverdale's. In April, 1539, appeared the *Great B.*, usually called Cranmer's, because he wrote a preface to it. It was a large volume for use in churches. The text was Tyndale's revised. In the same year, Richard Taverner, a learned but eccentric layman belonging to the Inner Temple, published an edition, the text of which is based on that of Matthew's Bible. In 1557 appeared the famous *Geneva B.*, so called because the translation was executed there by several English divines, who had fled from the persecutions of the bloody Mary. Among these may be mentioned Gilby and Whittingham. This edition—the first printed in Roman letter and divided into verses—was accompanied by notes, which showed a strong leaning to the views of Calvin and Beza. It was, in consequence, long the favorite version of the English Puritans and the Scotch Presbyterians. It is, however, best known as the *Breeches B.*, on account of the rendering of Genesis iii. 7: "Then the eyes of them both were opened, and they knew that they were naked, and they sewed fig-tree leaves together, and made themselves *breeches*." In 1568, the *Bishops' B.* was published at London. The text of this was compared with the original by eight bishops, and seven other scholars of reputation, who appended their initials to their respective tasks; the whole being under the superintendence of Matthew Parker, archbishop of Canterbury. In 1582 appeared at Rheims, in France, an English version of the New Testament, prepared by several Roman Catholic exiles; and in 1609–10, a similar version of the Old Testament at Douay. Both were taken from the Vulgate, and form the standard English Scriptures of the Roman Catholics, being generally known as the *Douay Bible.*

We now come to the version which has been in common use for nearly 250 years, generally called *King James's Bible.* At the Hampton court conference in Jan., 1604, Dr. Rainolds, an eminent Puritan, suggested a new translation as a great national want; and this, though opposed by the bishop of London, was sanctioned by the king. Arrangements were at once made for carrying out the project. In July, the king wrote a letter, intimating the appointment of 54 scholars for the preparation of the version, and instructing the bishops that whenever "a living of twenty pounds" became vacant, they should inform his majesty of the circumstance, in order that he might recommend one of the translators to the patron. This was all that James did on behalf of the translation which bears his name. The expenses seem to have been borne by Barker, the printer and patentee, who paid the sum of £3500. Of the 54 scholars who had been nominated to the work, only 47 undertook it. These were divided into six companies, two of which were to meet at Westminster, two at Cambridge, and two at Oxford. The *first* company at Westminster translated the Pentateuch and the historical books to the end of 2d Kings; the *first* at Cambridge, from the beginning of Chronicles to the end of Canticles; and the *first* at Oxford undertook the remaining books of the Old Testament canon. The second company at Westminster translated the apostolic epistles; the second at Cambridge, the Apocrypha; and the second at Oxford, the gospels, the Acts of the Apostles, and the Apocalypse. According to Selden, "they then met together, and one read the translation, the rest holding in their hands some B., either of the learned tongues, or French, Spanish, Italian, etc. If they found any fault, they spoke; if not, he read on." When a portion was finished by one of the company, it was sent to all the others in succession for their deliberative examination; and whenever a difference of opinion was elicited, reference was made to a committee. The final revision of the whole was conducted in

London by two delegates from each of the six companies. These twelve scholars, in the discharge of their critical functions, met daily in the old hall of the stationers' company for nine months. The work of translation and revision occupied from 1607 to 1610. The superiority of the authorized version soon proved itself; for though there were several rivals in the field, and no steps were taken to secure for it a preference, it quickly gained the foremost place, and in the course of forty years from its publication, all others had quietly succumbed to it; it became, and has ever since remained *the English Bible*. Its ascendency, and its exclusive use among all classes in Great Britain, and in her vast colonies, can only be traced to its intrinsic excellence. A new English version, however, has been in course of preparation for some years.

The exclusive right to print the present authorized version has been claimed by the crown, ever since the date of its first publication, and under this royal prerogative, the B. is printed in different forms, and sold wholesale by certain patentees and licensees in England, Scotland, and Ireland. This claim, which does not practically affect Bibles with notes, has lately been much demonstrated against as a monopoly injurious to the free circulation of the Scriptures at a moderate price, and a modification is now looked for (see BOOK TRADE).

The more liberal Catholics—especially the Jansenists De Sacy, Arnauld, and Nicole; the enlightened Richard Simon and Quesnel—also shared in the common zeal for diffusing a knowledge of the Scriptures; but though many versions have been prepared by Catholics, the Romish church has consistently maintained an opposition to the general circulation of Holy Scripture without ecclesiastical comments.

The numerous recent translations of the Scriptures into languages beyond the pale of Christendom, have been executed chiefly under the auspices of missionary and bible societies (q.v.).

As to the *contents* of the B., its one grand object, under whatever form it may appear in the various books, is, to give an account of this world, both in its origin and government, as the work of an Almighty Creator, always and everywhere present; and especially to exhibit the relation of man to this Creator, and, in consequence of that relation, in what manner and with what hopes he ought to live and die—subjects undeniably the most momentous that can occupy human thought. The sacred books of other religions have all an analogous aim; to account, namely, for the origin of all things, and to explain the nature and human relations of that something *divine*, which it is an instinct of the human mind to conceive as actuating and controlling all that moves. But so different, so immeasurably superior to all other sacred books is the B. in the conception it unfolds of the divine nature as one personal God, exercising towards men the love and care of a parent to his offspring, and in the system of human duties springing therefrom, that on this consideration alone many rest its claim to being received as a direct revelation from heaven. The questions regarding the B., considered in this point of view, fall to be treated under the heads of INSPIRATION and REVELATION. To attempt to analyze or give any detailed account of the contents of the Scriptures, is beyond the scope of this article. The leading features of the doctrines and precepts, as a system, will be briefly sketched under the head of CHRISTIANITY; while the chief individual doctrines receive notice under their respective names, and in the accounts of the controversies to which they have given rise.

BIBLE, CURIOUS EDITIONS OF. Besides those issues of the book which have historical importance are those notable for curious errors, or for incidents of publication. The following is a list of the more familiar of these, with their peculiar designations:

THE GUTENBERG BIBLE.—The earliest book known, printed from movable metal types, is the Latin Bible issued by Gutenberg, at Mentz, A.D. 1450.

THE BUG BIBLE.—So called from its rendering of Psalms, xci.: 5: "Afraid of bugs by night." Our present version reads, "terror by night." A.D. 1551.

THE BREECHES BIBLE.—The Geneva version is sometimes called the Breeches Bible, from its rendering of Genesis, iii.: 7: "Making themselves breeches out of fig-leaves." This translation of the Scriptures—the result of the labors of the English exiles at Geneva—was the English Family Bible during the reign of queen Elizabeth and till supplanted by the present authorized version of king James I.

THE PLACE-MAKERS' BIBLE.—From a remarkable typographical error which occurs in Matthew, v.: 9: "Blessed are the place-makers," instead of peace-makers. A.D. 1562.

THE TREACLE BIBLE:—From its rendering of Jeremiah, viii.: 22: "Is there no treacle [instead of balm] in Gilead?" A.D. 1568.

THE ROSIN BIBLE.—From the same text, but translated "Rosin" in the Douay version. A.D. 1609.

THE HE AND SHE-BIBLES.—From the respective renderings of Ruth, iii.: 15—one reading that "She went into the city." The other has it that "He went." A.D. 1611.

THE WICKED BIBLE.—From the fact that the negative has been left out of the seventh commandment (Exodus, xx.: 14), for which the printer was fined £300. A.D. 1631.

THE THUMB BIBLE.—One inch square and half an inch thick, was published at Aberdeen. A.D. 1670.

THE VINEGAR BIBLE.—So named from the head line of the 20th chapter of Luke, which reads as "The parable of the vinegar," instead of the vineyard. A.D. 1717.

THE PRINTERS' BIBLE.—We are told by Cotton Mather that in a Bible printed prior to 1702, a blundering typographer made king David exclaim that "Printers [instead of princes] persecuted him without a cause." See Psalms, cxix.: 161.

THE MURDERERS' BIBLE.—So called from an error in the 16th verse of the Epistle of Jude, the word "murderers" being used instead of "murmurers." A.D. 1801.

THE CAXTON MEMORIAL BIBLE.—Wholly printed and bound in 12 hours, but only 100 copies struck off. A.D. 1877.

BIBLE, PROHIBITION OF. This is one of the main points of opposition between the Roman Catholic and the Protestant church. In the earliest times we find no evidence of any prohibition of Bible-reading by the laity. On the contrary, as the foundation on which the church was built, and the sole source of religious knowledge, the reading of the Bible formed an essential part of the instruction communicated by pastors to their congregations; and the greatest orators of the church—especially Chrysostom and Augustine—continually reminded their hearers that private reading and study of the Scriptures should follow attendance on public services. This great fact is by no means contradicted by the warnings found here and there in the fathers against abuse or mistake of the meaning of Scripture; these warnings rather imply that Scripture-reading was common among the laity. The gradual widening of the distinction, or rather the separation, between the clergy and the laity, was the work of the middle ages; and, among other means of preserving traditions inviolate and maintaining the exclusive character and sacred authority of the hierarchy, the Bible was held in the background, even while there was no direct prohibition of its common use. In 1080, Gregory VII. ordained that Latin should be the universal language of Catholic worship, and consequently excluded all vernacular readings of Scripture in public assemblies. Again, with regard to the Waldenses, Innocent III., in 1199, prohibited the private possession and reading of Scripture (excepting the portions contained in the Breviary and the Psalter) without priestly permission and supervision. Similar prohibitions were repeated at Toulouse (1229), at Béziers (1233), and with regard to Wickliffe, at the synod of Oxford (1382). Ultimately, the recognized Latin version, or vulgate, was more and more decidedly made the sole authorized church version. Indeed, as early as 1234, the synod of Tarragona denounced as a heretic any one who, having a translation of the Bible, refused to surrender it to be burned within the space of eight days. As, however, it soon appeared plain that little could be effected by such prohibitions, milder measures were employed. The Tridentine council, being required to pronounce on the question of Bible translations, purposely employed a word of ambiguous meaning in styling the vulgate simply "authentic;" but nothing was determined on Bible-reading among the laity. This was first done in the publication of the first *Index Librorum Prohibitorum* soon after the Tridentine council. Afterwards, the rules of the church, placing the use of the Scriptures under the supervision of the bishops, were more and more strictly defined. The publication of the New Testament with practical annotations by Paschasius Quesnel (1687), gave occasion to the Roman Catholic church to speak more definitely on the reading of the Bible by the laity in the bull *Unigenitus Dei Filius*, 1713. New ordinances were issued by pope Pius VII. in his brief to the archbishop of Gnesen and Mohilew (1816) against translations formerly authorized; again, by Leo XII., in his condemnation of Bible societies (1824), and by Pius VIII. All these ordinances of the Roman Catholic church imply that it is dangerous to give the Bible freely to the laity, and that, therefore, no vernacular versions ought to be used without interpretations taken from the fathers, and an especial papal sanction.

BIBLE, REVISED ENGLISH VERSION. A revision of the English Bible, or "authorized version," has been in progress for about ten years and is now nearly completed. A deep and general interest is felt in the reasons assigned for making this revision, in the nature of the alterations proposed, and in the character and qualifications of the men selected for the work.

I. *The reasons assigned for a revision.*

1. The division into chapters and verses needs to be revised. The division into chapters was made by cardinal Hugo de Sancto Caro, about the middle of the 13th century. The verses of the old testament are of earlier date and Jewish origin. Those of the new testament were made by Robert Stephens, for his edition of the Greek testament published in 1551. The division into chapters was introduced into the earlier English versions; the verses appeared first in the Geneva bible of 1560. As these divisions were hastily made and with a view to convenient reference rather than to an accurate exhibition of the subject matter, it is not surprising that some passages are severed which ought to be connected, and that others are connected which ought to be separate. For example: in Gen. i., the six days of the creative week are cut off from the seventh day; Is. liii. ought to begin with the last three verses of lii.; and Rev. xxii. should yield its first 5 verses to xxi.

2. There are obsolete words which might, with advantage, be exchanged for words in current use. The authorized version has contributed greatly to the permanence of the English language. Yet some words have slipped out of use, notwithstanding its hold upon them. Among these are "wist" not, for *knew* not, or *did not consider;* "eschew," for *shun;* "leasing," for *falsehood;* "broided," for *braided;* "neesing," for

sneezing. Some words that are retained in use have changed their meaning since the translation was made. "By and by" then meant, *immediately*, now it means *after a while;* to "prevent," was to *go before*, now to *restrain;* to "let," was to *hinder*, now to *permit.*

3. Sometimes proper names have been translated as common nouns; in other instances the reverse has been done. "From the tower of Syene unto the border of Ethiopia," should be—from Migdol unto Syene, the border of Ethiopia; "the house of God," should sometimes be translated, Bethel; "populous No," should be, No-Ammon; "a hollow place that was in the jaw," should be—the hollow place that is in Lehi. On the other hand, "the children of Sheth," should be—tumultuous children; "men of Belial"—worthless, wicked men; the "Gammadims" in the towers of Tyre—warriors; "Pannag," not a country, but an article of commerce.

4. Often the disregard of the definite article, both in Hebrew and Greek, has made the translation inaccurate or vague. "There is a feast of the Lord in Shiloh" should be—the feast of the Lord is in Shiloh. David's wondering exclamation in acknowledgment of the promise that in the distant future the incarnate Messiah should be his son, instead of being, vaguely, "Thou hast regarded me according to the estate of a man of high degree," should be—according to the estate of THE MAN, THE EXALTED ONE. In the new testament, "a city which hath foundations," should be—the city which hath the foundations; and, "a good fight" which Paul had fought was—the good fight of faith.

5. In many passages the distinction between tenses of Hebrew and Greek verbs has been neglected or incorrectly rendered. In the old testament the imperfections from this source are most numerous in the poetical and prophetical books. The future is there often translated as the past. "I cried," instead of—I will cry; "the Lord sustained," instead of—will sustain; "God came," instead of—will come; "and made intercession for the transgressors," instead of—and will make. Often the future is rendered as the imperative, so that a confident declaration seems a command or a prayer. Thou wilt not withhold Thy tender mercy, is changed into, "withhold not Thou." Often the prophets seem to be declaring the past when they are foretelling the future. In the new testament similar inaccuracies in translating tenses are found. The continued action expressed by the imperfect, is sometimes disregarded. We find, "their nets brake," instead of—were breaking; "they brought to Him a man sick of the palsy," instead of —were bringing. The completed past of the perfect tense is sometimes translated as a present; "I am crucified with Christ," instead of—I have been; and at other times, by the indefinite past, "anything made that was made," for—has been made; "was counted worthy," for—has been. The indefinite past tense also is translated as a perfect or a present; "death passed upon all men for that all have sinned," instead of—for that all sinned; "we that are dead to sin," instead of—we that died to sin.

6. One and the same original word is often translated by various English words, both in different places and in the same context. On the other hand one and the same English word is sometimes used to express different words in the original. The Divine being who made a covenant with Abraham is called, "the Angel Jehovah;" but when Malachi calls the Lord—the Angel of the Covenant, the translation more vaguely says, "the Messenger of the Covenant." "Blameless" and "guiltless" are used in translation of the same word; so are "everlasting" and "eternal;" "wonder," "admiration," and "marvel;" "goodly" and "gay;" "lust," "coveting," and "concupiscence;" "love" and "charity;" "hope" and "trust;" "happy" and "blessed;" "atonement" and "reconciliation;" "mad" and "beside thyself." We find one Greek word which is expressed by seven English words—"straightway," "immediately," "forthwith," "anon," "as soon as," "by and by," and "shortly." On the other hand one word in the translation sometimes represents very different words in the original. The majestic Nile is pre-eminently "the river of Egypt;" yet the translation gives the same epithet to a comparatively insignificant brook. The opprobrious name "fools" is fastened alike on the atheistic and the inconsiderate; "hell," is used both for the state of the dead and for the place of the wicked in misery; "devil" is the name given both to Satan and to the demons subject to him; the verb "to be" is made to express both the birth of a creature and the eternal existence of the Son of God.

7. The italic words call for revision. The authorized version is remarkable for the abundant use of italic letters, not to mark emphasis, as in other books, but to distinguish words not expressed in the original, yet, as the translators thought, implied in it and rendered necessary by difference of idiom between the ancient languages and our own. They are to be valued as a proof of the honesty and care with which the translation was made. In many instances they are also useful in making the meaning clear. Yet a thorough revision of them is, in the opinion of well qualified judges, greatly to be desired. Many of them are superfluous, since they are fairly implied in the original. Among these are parts of the constantly recurring verb "to be;" and personal, possessive, and relative pronouns, which are plainly implied in the original and necessary to the sense. In Jn. xx. 5, "stooping down *and looking in*," the italics are not required, since the original verb includes both acts in its signification; and in 1 Pet. i. 12, as applied to angels, it is translated "to look into," without any attempt to express the stooping down. "Some *say that thou art* John the Baptist, might better be only—some *say*, John the Baptist; and "*by the space of* 40 years," is simply—40 years. On the other hand, some italic words

have nothing, expressed or implied, in the original to warrant them. "*There is* no speech nor language *where* their voice is not heard," should be only—there is no speech nor language; their voice is not heard. In Jn. viii. 6, "*as though he heard them not,*" is an addition without warrant, undertaking to declare the object of Jesus in writing on the ground when the text gives no intimation of it.

In Matt. xxv. 14, the italics say, "*the kingdom of Heaven is* as a man;" and in Mk. xiii. 34, "*the Son of man is;*" but in both cases it is THE TIME spoken of in the preceding verse that is the object of comparison.

8. Revision is called for by the knowledge concerning the original texts which has been attained since the authorized version was made. The Hebrew text then in use possessed the great advantage of being accepted by Christians and Jews alike. It had been edited by Jewish scholars and watched over from generation to generation with reverent and even superstitious care. New copies were always minutely compared with the old. All errors and variations in words, letters and accents were noted in the margins of the manuscript, but the text itself was never changed, These marginal notes are continued in the printed Hebrew bibles and often manifestly contain the true reading. But sometimes our translators followed the text and translated the marginal reading only in their margin. And, as the great majority of English bibles do not give the marginal readings, a large proportion of persons have no means of knowing the correction. In Is. ix. 3, an apparent contradiction results from this cause, making the passage unintelligible; "Thou hast multiplied the nation and NOT increased the joy; they joy before Thee ACCORDING TO THE JOY OF HARVEST" (that is—with a joy increased to the utmost). While the word translated "not" is in the Hebrew text, it is corrected in the margin by another (slightly different in form but having the same pronunciation) meaning *his* or *their;* and the translation should be—and increase THEIR joy. Thus the sentence becomes harmonious and clear. The Greek text of the new testament which the translators used had been printed from a small number of comparatively modern manuscripts imperfectly collated. Since then a much larger number have been discovered; some of which are of great antiquity and value. The collation of both Hebrew and Greek manuscripts, which has been prosecuted so assiduously since 1611, has produced many corrections, to the accuracy of which the best critics are agreed. They are indeed of various degrees of importance; none of them affect vitally the integrity of the Scriptures; many are very slight; yet not a few increase, decidedly, the clearness and force of the record; and on the whole they are considered to furnish a valid reason for a thorough revision.

9. Besides the erroneous or defective translations which have arisen from the sources already pointed out, others exist for which various causes might be assigned. The whole of Is. ix. 1, in connection with the preceding context needs revision, in order to dispel its darkness. We specify, now, only the latter part: "when at the first he lightly afflicted the land of Zebulon and the land of Naphtali and afterward did more grievously afflict her by the way of the sea, beyond Jordan, in Galilee of the nations:" this should be—as the former time degraded the land of Zebulon and the land of Naphtali, so the latter time shall glorify the way of the sea beyond Jordan, Galilee of the nations. "Woe to him who ladeth himself with thick clay," should be—who ladeth himself with goods taken in pledge. "To hunt souls to make them fly"—to hunt them as birds. "All that make sluices and ponds for fish"—all that work for wages are sorrowful in heart. The place in Jerusalem where Huldah dwelt was not "the college," but the second division of the city. "The land that thou abhorrest shall be forsaken of both her kings," should be—the land of whose two kings thou art afraid, shall be forsaken. It is not said in Job concerning the war-horse, "neither believeth he that it is the sound of the trumpet;" but—"he will not stand still when the sound of the trumpet is heard." The translation of Matthew's narrative concerning the receivers of what it calls "tribute money" who came to Peter, fails to show that it was not the political tribute to Rome which Jesus was asked to pay; thus the force of his claim to be rightfully exempt does not appear; also, "a piece of money," might be either too little or too much for Peter and himself. But in the Greek these points are definite and clear. The money demanded was the half shekel which the Mosaic law required every Jew to pay for the support of God's house; from this the Son of God, according to the analogies of earthly kings, was certainly free; and the specific coin which Peter was to find, was the exact amount for two. At the close of Heb. iii., there are three questions asked and answered, all closely related to one another and to the argument. But the first of them, the authorized revision changes to a positive, yet indefinite assertion, to the injury of the sense: "for some, when they had heard, did provoke; howbeit not all that came out of Egypt by Moses;" which should read interrogatively—for who were they who when they heard, provoked? Were not all of them those who came out of Egypt by Moses?

II. *The nature of the alterations proposed.* While the facts thus indicated may be accepted as supplying reasons for a thorough revision of the English Bible and as indicating the nature of the results expected, they also show that only a *revision* is required of the translation which, having been so long in use, is so diligently studied, ardently loved, and widely diffused. A new *translation* is not needed, is not desired, and, if made, could never take the place of the old. The revised Bible will read like the old; the hallowed associations which throng around it will not be dispelled; and when the

work is complete its greatest value will appear, not in the changes made, the obscurities removed, the errors corrected, and the improvements introduced; but in the confidence inspired by the fact that, thoroughly tested, line by line, and word by word during more than ten years by chosen companies of men most profound and exact in scholarship, the English Bible, needing no essential change, is confessed to be the most adequate and accurate translation that can now be made; and that the vast proportion of its renderings are without a flaw.

III. *Principles adopted for the work of revision.* 1. To make as few alterations as possible, consistently with faithfulness. 2. To limit, as far as possible, the expression of such alterations to the language of the authorized or earlier versions, preserving the former style. 3. Each company to go twice over the portion to be revised; once provisionally; the second time, finally. 4. To adopt the Hebrew or Greek text for which the evidence decidedly preponderates; and when this differs from that from which the authorized version was made, to indicate the difference in the margin. 5. On the first revision to decide by simple majorities; but on the final revision by each company to retain no change in the text not approved by two thirds of those present. 6. When a proposed alteration has given rise to discussion, to defer voting thereon till the next meeting whenever one third of those present so desire; such intended vote to be announced in the notice for the next meeting. 7. To revise the headings of chapters and pages, the paragraphs, italics, and punctuation. 8. That each company shall refer, when considered desirable, to divines, scholars, and literary men, whether at home or abroad, for their opinions.

IV. *The names and stations of the Committees of Revision.* This revision had its origin in the convocation of Canterbury, May 6, 1870, by the appointment of a committee of eminent biblical scholars and dignitaries of the church of England with power to revise, for public use, the English version of 1611; and to associate with them representative biblical scholars of other Christian denominations using that version. In accordance with the authority given them, that committee invited the appointment of a similar American committee, to be associated with them, virtually in one organization, with the same principles and objects and to be in constant correspondence with them, that both together may issue one and the same revision for all English-speaking people.

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Robert L. Bensly, fellow and Hebrew lecturer, Gonville and Caius college, Cambridge.
John Birrell, professor of oriental languages, St. Andrew's, Scotland.
Frank Chance, London.
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A. B. Davidson, D.D., professor of Hebrew, Free Church college, Edinburgh.
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AMERICAN REVISION COMMITTEE.

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John De Witt, D.D., theological seminary, New Branswick, N. J.
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Philip Schaff, D.D., LL.D., Union theological seminary, New York.
Charles Short, LL.D. (Secretary), New York.
E. A. Washburn, D.D., Calvary church, New York.
New testament company, 13. *In both companies*, 27. *Total, British and American*, 79.

BIBLE SOCIETY, an association having exclusively for its object the diffusion of the sacred Scriptures. Such associations must be regarded as a natural form of expression of Christian benevolence, acting according to the principles of Protestantism, and seeking to take advantage of the facilities afforded by the art of printing; but a long period elapsed after the reformation before a B. S. was formed; during which, however, an extensive diffusion of the Scriptures took place, and partly by the agency of associations which included it among other means for the advancement of Christianity. It necessarily became, along with the translation of the Scriptures, one of the objects to which missionary societies directed their energy. But perhaps the first association ever formed for the sole and specific purpose of providing copies of the Scriptures for those who were destitute of them, was that founded by baron Hildebrand von Canstein, an intimate friend of Spener, in conjunction with Francke at Halle, and which, down to 1834, when other Bible societies had begun to be established in Germany, had distributed 2,754,350 copies of the Bible, and about 2,000,000 copies of the New Testament.—The impulse, however, to the formation of the Bible societies now existing in all parts of Protestant Christendom proceeded from England, where, in 1780, an association was

formed for the distribution of Bibles among soldiers and sailors. It was at first simply called *The B. S.;* it exists to the present day, is now known as the *Naval and Military B. S.*, and confining itself to its original specific object, has accomplished much good. It is not an uninteresting circumstance, that the first ship in which Bibles were distributed by this society was the ill-fated *Royal George.*—In the beginning of 1792, a similar association was formed in London, under the name of the *French B. S.*, with a similar limited and specific object of distributing Bibles in the French tongue. It was probably the attitude assumed by infidelity in France which gave occasion to the formation of this society, but the greater part of its funds having been remitted to Paris for the printing of the Bible there, were lost, and everything belonging to the society destroyed in the tumult of the revolution.—It was not till 1802 that the first steps were taken towards the formation of the BRITISH AND FOREIGN B. S., the parent of a multitude of similar institutions, and the establishment of which must be regarded as the great epoch in the history of this branch of Christian beneficence; nor was the society fully organized and established till Mar. 7, 1804. Its formation took place in consequence of the deep impression made upon the mind of the Rev. Thomas Charles of Bala, in Wales, by the destitution of the sacred Scriptures which he found to exist in the sphere of his labors, and particularly by a circumstance strikingly illustrative of that destitution. Meeting a little girl in one of the streets of the town, he inquired if she could repeat the text from which he had preached on the preceding Sunday. Instead of giving a prompt reply, as she had been accustomed to do, she remained silent, and then weeping told him that the weather had been so bad she could not get to read the Bible. She had been accustomed to travel every week seven miles over the hills to a place where she could obtain access to a Welsh Bible. Mr. Charles, on his next visit to London, brought the subject of the want of Bibles in Wales under the notice of the committee of the *Religious Tract Society* (q.v.), when it was suggested by Mr. Hughes, a member of the committee, that a society might be formed for the purpose of supplying Bibles not only in Wales, but wherever destitution existed throughout the world. The society was constituted on the widest possible basis, churchmen and dissenters being alike included in it; and soon attained a greatness corresponding with that of the other two religious societies, the *London Missionary Society* (see MISSIONS), and the *Religious Tract Society* (q.v.), which had been formed on similar principles a few years before. It was indeed able to expend only about £619 in the first year of its existence. Its annual income gradually increased to an average of £70,000. But in 1875–76 it amounted to £116,802, derived from donations, legacies, collections, etc., and applicable to the general purposes of the society, besides £108 for a special object (the "Roxburgh fund"), and £105,410 derived from sales of Bibles and Testaments, abstracts, monthly reporters, etc.: showing the total net receipts for that year to be £222,320. Auxiliary and branch societies and dependent associations rapidly sprung up in all parts of Britain and in the colonies, the number of which at present amounts to between 5000 and 6000. Much more than one half of the expenditure of the British and foreign B. S. has been devoted to the diffusion of the authorized English version of the Bible, the only English version with which its fundamental rules permit it to have anything to do; it has also spent large sums in printing and circulating the Scriptures in the different Celtic languages spoken in Great Britain and Ireland, and a very important branch of its operations has been the printing of translations of the Bible prepared by missionaries. The number of translations of the Scripture—in many cases complete, in others extending only to the New Testament, in some only to particular books—which have been printed at the expense of the society, amounts to not less than 190, the greater part being translations never before printed, and many in languages possessing no previous literature.—The British and foreign B. S. now issues annually nearly three million copies of the Bible, the New Testament, or such portions of sacred Scripture as have been printed in languages not possessing complete translations. The whole number issued from the formation of the society to 31st Mar., 1876, was 76,432,723. This society also employs agents of high education and Christian character, to visit different countries for the promotion of its great object. The names of Dr. Henderson and Dr. Pinkerton, former agents, must be familiar to many readers, and perhaps no instance could be mentioned more happily illustrative of the character of this branch of the society's operations than the visit of Dr. Henderson to Iceland, an account of which is given in his well-known volume of travels in that country.—A controversy concerning the circulation of the books of the Apocrypha along with the canonical Scriptures by the British and foreign B. S. (see APOCRYPHA), led to a resolution in 1826, that its funds should be devoted, according to its original design, to the diffusion of the canonical books alone.—The EDINBURGH B. S. existed from that time forward as an entirely separate society, till 1861, when all the Scotch societies amalgamated to form the NATIONAL BIBLE SOCIETY OF SCOTLAND.

The AMERICAN B. S. is, in the magnitude and importance of its operations, next to the British and foreign Bible society. It was founded at New York in 1817, and still has its head-quarters in that city, in the *Bible House*, a very large and magnificent building, erected by special subscription. It reckons fully 2000 auxiliary societies, in all parts of the United States. Its income now amounts to about $700,000 (£140,000) a year, rather more than one-half being derived from sales of Bibles and Testaments, and the rest from donations, collections, etc. The American B. S. has for

some time issued annually more than 1,000,000 Bibles, New Testaments, and other portions of Scripture, and has in all distributed about 31,000,000 copies. The funds of the society have been chiefly expended in supplying the wants of the inhabitants of the United States, amongst whom the Indian tribes have not been neglected. "The Bible Association of Friends in America," founded at Philadelphia in 1829, has also distributed the Bible extensively.

Of the numerous Bible societies of Germany, the most important and extensively ramified is the Prussian central B. S. (*Hauptbibelgesellschaft*) in Berlin. It was founded in 1814, has branches in all parts of the Prussian dominions, and distributes annually about 35,000 Bibles and 14,000 New Testaments. There are besides numerous independent Bible societies in other parts of the German empire. A large number of Bibles are still, however, annually supplied to the people of Germany by the agents of the British and foreign B. S.—Bible societies were prohibited by the Austrian government in 1817, and some which had already been established in Hungary were dissolved.—The RUSSIAN B. S., founded at St. Petersburg in 1813, through the exertions of Dr. Paterson, and under the patronage of the emperor Alexander I., entered upon a career of great activity and usefulness, co-operating with the British and foreign B. S. for the printing of the Scriptures in the numerous languages spoken within the Russian dominions; but its operations were suspended in 1826 on the accession of the emperor Nicholas, its stock of Bibles, and the whole concern, being transferred to the *Holy Synod*, under the pretense that the sacred work of supplying the people with the holy Scriptures belonged to the church, and not to a secular society. The Bibles and Testaments in stock were indeed sold, and very large editions were thus disposed of, but the activity of a society which had no equal in continental Europe was at an end. A Protestant B. S. was then formed for the purpose of providing editions of the Scriptures, and circulating them among the Protestants of all parts of the empire, which now reckons about 300 auxiliary societies. But the action of this society "does not touch the members of the Greek church, or, if at all, only slightly and incidentally, and it makes no provision of the Scriptures in the language spoken by the great mass of the people. It is merely designed to meet the wants of colonists and others, who do not use the Russian language." Of the translations of the Scriptures published by the original Russian B. S., the greater number have never been reprinted since its suppression.

There can be no doubt that Bible societies have contributed very much to the progress of Christianity and civilization since the beginning of the 19th c., and their influence is continually increasing and extending.

BIBLE SOCIETY, AMERICAN. The first portion of Scripture printed in America was the New Testament, translated into the Indian language by John Eliot, and printed at Cambridge, Mass., in 1661; a translation of the whole Bible followed in 1663. A German Bible was printed at Germantown, Penn., in 1743. In 1777, the English New Testament, and in 1782 the entire Bible, was printed at Philadelphia. This was the first English Bible with an American imprint, and it was recommended by Congress, after an examination by the chaplains. The first Bible society in the United States was instituted at Philadelphia in 1808; the second, at Hartford; the third, at Boston; the fourth, at Princeton, N. J.; all in 1809. A few years later, about 60 local societies existed. Delegates from 35 of these met in New York, May, 1816, and organized the American Bible society, to which the local organizations became auxiliary. The number of auxiliaries increased rapidly, and at present amounts to 7000, including branches. In 1841, an act of incorporation for the American B. S. was obtained, with privileges which have since been enlarged. The first place of business was a room 7 ft. by 9; the next was 20 ft. sq.; the third was in a building erected in Nassau street, on a lot 50 ft. by 100; and afterwards enlarged. In 1852, the present Bible house was built, occupying the whole of the ground bounded by Third and Fourth avenues, Astor place and Ninth street, having a periphery of more than 700 ft., an open square in the center, and being 6 stories high. The structure is of brick with stone copings, and commands attention by its magnitude, admirable proportions, and appropriate finish. The working force consists of the executive and manufacturing departments; the former containing the corresponding secretaries, treasurer, and general agent; the latter includes printing, electrotyping, proof-reading, and other branches of the work. The number of persons employed is about 350. The printing is now executed on 23 large steam-power presses, and 3 of smaller size. In the bindery, also, the best modern improvements have been introduced. The society owns 120 sets of stereotype and electrotype plates, from which are printed 22 sizes of English Bibles, and 16 sizes of the New Testament; each size is bound in from 4 to 6 styles, as there is a demand for Bibles of all sizes in fine bindings; but by far the greater proportion of all issued are in plain styles, and are circulated among the poor. The whole Bible has been stereotyped, at great expense, in the Boston raised letter for the use of the blind. It is issued in 8 or in 16 volumes, any of which may be obtained separately. About 12,000 volumes have been circulated, in great part gratuitously.

The aim of the American B. S., and its auxiliaries, is to distribute Bibles as widely as possible among the destitute of all classes and religious denominations, either selling them at cost, or for a portion, of it, or giving them away to the very poor.

In 1829, an exploration of the states and territories was made, with a view to a general supply of the destitute. Every accessible family in the more settled portions of the country was visited. In 1856, a second general effort resulted in the supply of about 500,000 destitute families. In 1866, a third supply of the whole country was commenced, and has been vigorously carried forward.

The foreign work of the American Bible Society was done at first chiefly through missionary societies, by the contribution of funds to aid them in printing the Bible. In this way the countries are reached in which the American churches had established missions. The Scriptures are now published at the Bible house in French, Spanish, Portuguese, Welsh, German, Danish, Swedish, Arabic, Armenian, and Hawaiian. The New Testament, also, in Italian, Slavonic, Bulgarian, Syriac, Cherokee, Choctaw, Dakota, and Ojibwa. Smaller portions are printed in many additional languages. Editions have been prepared for the society at Paris, Bremen, Stockholm, St. Petersburg, Constantinople, Beirut, Lucknow, Lodiana, Bangkok, Foochow, Peking, Shanghai, Yokohama, and Honolulu.

RECEIPTS AND ISSUES OF THE AMERICAN BIBLE SOCIETY.

Decades.	Receipts.	Vols. Issued.
1816–26	$450,000	440,000
1826–36	955,000	1,550,000
1836–46	1,233,000	2,510,000
1846–56	3,042,000	6,772,000
1856–66	4,755,000	10,513,000
1866–76	6,794,000	11,340,000

BIBLE SOCIETY, AMERICAN AND FOREIGN, an organization formed by Baptists, who desired that translations of the Bible in foreign lands should conform as nearly as possible to the original Hebrew and Greek. In this they had mainly in view the rendering of *βαπτίζω* by *immerse* instead of *baptize*. In the circulation of the English Scriptures, they were willing that, for a time, the authorized version should be used. In 1850, a portion of the denomination, dissatisfied with this course, formed The American Bible Union, whose object, as set forth in its constitution, is "to procure and circulate the most faithful versions in all languages throughout the world." It has done much in foreign lands; and, with the assistance of scholars both in Europe and America, is engaged in revising the authorized version.

BIBLIA PAUPERUM, or Bible of the Poor, was a sort of picture-book of the middle ages, giving, on from forty to fifty leaves, the leading events of human salvation through Christ, each picture being accompanied by an illustrative text or sentence in Latin. A similar and contemporaneous work on a more extended scale, and with the legend or text in rhyme, was called *Speculum Humanæ Salvationis*, i.e., the "Mirror of Human Salvation." Before the reformation, these two books were the chief text-books used, especially by monks, in preaching, and took the place of the Bible with the laity, and even clergy; and as the lower orders of the regular clergy, such as the Franciscans, Carthusians, etc., took the title of "Pauperes Christi," Christ's Poor, hence the name. Many manuscripts of the *B. P.*, and of the *Mirror of Salvation*, several as old as the 13th c., are preserved in different languages. The pictures of this series were copied in sculptures, in wall and glass painting, altar-pieces, etc., and thus become of importance in the art of the middle ages. In the 15th c., the *B. P.* was perhaps the first book that was printed in the Netherlands and Germany, first with blocks, and then with types. The chief proof for the discovery of printing in Haarlem rests on the first impressions of the *Speculum Humanæ Salvationis*. See Coster.

BIBLICAL ANTIQUITIES, or Biblical Archæology, is a study which has for its objects the social and political constitution, the manners, customs, geography, etc., of the Jews and other peoples mentioned in the Scriptures. A knowledge of these is essential to a right understanding of many passages of Scripture. The antiquities of the ancient Jews themselves undoubtedly form the most important part of such a study; but an examination of the laws, customs, etc., of the neighboring Semitic nations is likewise indispensable. The principal sources of such knowledge are the Old and the New Testament; the books of Josephus on *Jewish Antiquities*, and the *Wars of the Jews;* the writings of Philo, the Talmud and Rabbinical works; and, lastly, Greek, Roman, and Arabian writers, with medals, monuments, and other works of art, the accounts of travelers, etc. The first work on Hebrew archæology was Thomas Goodwin's *Moses et Aaron, seu Civiles et Ecclesiastici Ritus Antiquorum Hebr.* (Oxford, 1616). Among later treatises we may especially notice Jahn's *Biblical Archæology* (5 vols., Vienna, 1796-1805); Bauer's *Manual of Hebrew Antiquities* (Leip. 1797); De Wette's *Manual of Hebrew-Jewish Archæology* (Leip., 1814); Rosenmüller's *Manual of Biblical Antiquities* (Leip., 1823); and Winer's *Biblical Dictionary* (3d. ed., Leip. 1847). A convenient work of reference on this subject is Dr. Kitto's *Cyclopædia of Biblical Literature*, which numbers among its contributors many of the ablest British and continental scholars; or *The Pictorial Bible*, edited by the same writer; also Smith's *Dictionary of the Bible*.

BIBLIOGRAPHY, a term applied to the description and proper cataloguing of books. It is derived from *bibliographia*, which was employed by the Greeks to signify the transcription of books, while *bibliographos* was merely a copyist. The introduction of the term in the meaning which we now attach to it may be dated from the appearance of the first volume of De Bure's *Bibliographie Instructive* in 1763.

The bare enumeration of the works that have been written on this branch of literature would more than fill an ordinary volume; we shall here confine ourselves to the more important of them.

A favorite dream of bibliographers has been the production of a general catalogue, embracing the whole range of printed literature; and one attempt at least has been made to realize it. In the year 1545, Conrad Gesner published at Zurich, in one folio volume, his *Bibliotheca Universalis*, in which are described, under the names of the authors, arranged alphabetically, all the books of the Hebrew, Greek, and Latin languages about which the compiler could obtain information. This restriction as to language, of course, does away to some extent with the idea of universality indicated by the title-page; still, as the three which are included were in Gesner's time almost the only ones employed by men of learning, his work may be regarded as a nearly complete account of the state of printed literature as it then existed. The only other effort in this direction which we have to record is the *Bibliotheca Britannica* of Dr. Robert Watt, 4 vols. 4to (Edinburgh, 1824). Its object will be best described by the following extract from the preface to it: "The account given of British writers and their works is universal, embracing every description of authors, and every branch of knowledge and literature. What has been admitted of foreign publications, though selective, forms a very considerable and valuable portion of the work, and as none of note have been purposely omitted, the *Bibliotheca Britannica* may be considered as a universal catalogue of all the authors with which this country is acquainted, whether of its own or of the continent." This great work was compiled under very adverse circumstances, and its author did not live to see it through the press. It thus labors under all the disadvantages of a posthumous publication; but with all its faults both of omission and commission, which are neither few nor small, it deservedly maintains a high character as a work of reference, and is indispensable to the library of every bibliographer.

The other laborers in this field of literature, whose works we are about to notice, have confined themselves within narrower limits. Some, proceeding upon a principle of selection, endeavor to furnish the inquirer with the information he seeks in regard to books which are rare, curious, or valuable; others, again, aiming at greater completeness within certain bounds, restrict themselves to the description of a special class of works—the literature, for example, of a particular country or language; the productions of a celebrated press; the books published within a given period; those of which the authors have withheld their names, or have veiled them under a pseudonym; the treatises that have been written on a specific subject; and so on, together with a few which hardly admit of classification, but of which some examples will be given.

Bibliographical works on the selective principle form a numerous class; the following are amongst the more important: Vogt, *Catalogus Historico-criticus Librorum Rariorum*, 8vo (Francofurti, 1793). This is the fifth edition; the four preceding appeared successively at Hamburg in 1732, 1738, 1747, and 1753. David Clement, *Bibliothèque Curieuse, ou Catalogue raisonné de Livres difficiles à trouver*, 9 vols. 4to (Göttingen, 1750–60). The expression *catalogue raisonné* is usually, but erroneously, applied in this country to classified catalogues; yet the work of Clement, who was the son of a Frenchman, and certainly understood the language in which he wrote, is arranged alphabetically. It is simply what it professes to be, a descriptive and methodized account of the books which it includes; but unfortunately it was never completed. It terminates with the article *Hesiodus*, and the seven or eight volumes required to finish it have not been published. The *Bibliographie Instructive* of De Bure has already been mentioned; it extends to seven volumes 8vo, the last of which appeared in 1768. To these, however, should be added the *Catalogue des Livres de Gaignat*, 2 vols. 8vo (Paris, 1769), and the *Table destinée à faciliter la Recherche des Livres Anonymes*, 8vo (Paris, 1782). Ebert's *Bibliographisches Lexicon*, 2 bde. 4to (Leip., 1821–30), is an accurate and useful work. It has been translated into English, 4 vols. 8vo (Oxford, 1837). Lowndes's *Bibliographer's Manual* contains an account of rare, curious, and useful books, published in or relating to Great Britain, from the invention of printing, and may always be consulted with advantage. It appeared originally in 4 vols. 8vo (Lond., 1834); but a new edition, with many improvements, has since been published (1857–64) in 11 parts or 6 vols., under the editorship of Mr. H. G. Bohn. One of the most interesting and important works in this department of B. is the *Manuel du Libraire et de l'Amateur des Livres* of J. C. Brunet, of which it is hardly possible to speak in terms of too high commendation. It was first published in 1810, in 3 vols. 8vo; and the fifth edition, in 6 vols. 8vo (Paris, 1860–65), is now out of print. The sixth vol. contains a valuable classed catalogue, the only modern effort of this kind. Another work of a similar, but somewhat more extensive character, entitled *Trésor des Livres Rares et Précieux*, by J. G. T. Graesse, was published at Dresden, in 7 vols. 4to (1859–69). In it more attention has been paid to the northern literatures than in Brunet. To these may be added the amusing and instructive bibliographical works of the Rev. Dr. Dibdin.

Turning to special B., and taking the subjects of which it treats in the order given above, we have to notice first the works which confine themselves to the literature of a particular country or language. As regards Great Britain, we have besides Watt and Lowndes, already mentioned, the *Typographical Antiquities* of Ames and Herbert, 3 vols. 4to (Lond., 1785–90). A new and improved edition was projected by Dibdin, but was not completed. Volumes 1 to 4 only have appeared, 4to (Lond., 1810–19). A recent contribution to British B. is the *Critical Dictionary of English Literature and British and American Authors*, by S. A. Allibone, 3 vols. 8vo (Philadelphia, 1859–71). Of this work we regret that we cannot speak favorably. It faithfully reproduces most of the errors of Watt, with the addition of not a few for which the compiler is himself responsible. Our French neighbors possess a treasure in *La France Littéraire* of J. M. Querard, but it embraces only the 18th and 19th centuries. The continuation, begun by Querard, and afterwards carried on by Louandre and Bourquelot, forms 6 vols. 8vo (Paris, 1846–57). A further continuation by Lorenz (*Cat. Général de la Librairie Française pendant 25 ans* (1860–65, 4 vols. 8vo, Paris, 1867–71) brings the work down to a recent date. For the literature of Italy, we can only notice Gamba's *Serie de' Testi*, 4th ed. (Venice, 1839); and for that of Spain, the *Bibliotheca Hispana Vetus*, and the *Bibliotheca Hispana Nova*, of Antonio, the latest and best editions of which appeared at Madrid (1683–88) in folio. The authors of the Low Countries are enumerated in the *Bibliotheca Belgica* of Foppens, 2 vols. 4to (Brussels, 1739); and those of Scandinavia in the *Almindeligt Litteraturlexicon for Danmark, Norge, og Island*, of Nyerup and Kraft, 4to (Copenhagen, 1820). For Germany, we have Heinsius, *Allgemeines Bücherlexicon*, with supplements (10 vols. 4to, 1812–49), and Ebert's *Handbuch der Deutschen Litteratur*, 4 vols. 8vo (Leip., 1822–40). To this class also belong the *Bibliotheca Græca*, *Bibliotheca Latina*, and *Bibliotheca Latina Mediæ et Infimæ Ætatis* of Fabricius; Harwood's *View of the various Editions of the Greek and Roman Classics;* and Moss's *Manual of Classical Bibliography*. The oriental student will find much to interest him in the *Lexicon Bibliographicum* of Haji Khalfa, edited in the original Arabic, with a Latin translation by Fluegel, 7 vols. 4to, 1835–58.

Of works descriptive of the productions of particular presses, we can only notice Renouard's *Annales de l'Imprimerie des Alde* (3d ed. 8vo, 1834); the *Annales de l'Imprimerie des Estiennes*, by the same author, 8vo (Paris, 1837–38); and Bandini, *Juntarum Typographiæ Annales*, 2 vols. 8vo (Luccæ, 1791). The student may also consult with advantage the *Notice de la Collection des Auteurs Latins, Français, et Italiens Imprimés en petits Formats par les Elzeviers*, at the end of the 5th volume of Brunet's *Manuel*.

The bibliographers who have confined themselves to books printed within a given period are chiefly Panzer, *Annales Typographici ab Artis Inventæ Origine ad Annum M.D.* (continued, however, to 1536), 11 vols. 4to (Norimbergæ, 1793 to 1803); and Hain, *Repertorium Bibliographicum*, 4 vols. 8vo, 1826–38. The death of the author before the completion of this work, was the cause of the comparative inaccuracy observable in the 3d and 4th volumes. The article "Virgil," for example, is omitted altogether.

One of the earliest attempts to reveal the authorship of anonymous works was the *Theatrum Anonymorum et Pseudonymorum* of Vincent Placcius, folio (Hamburg, 1708); to which Mylius added a supplement in 1740. So far as France is concerned, these have both been superseded by the admirable and well-known *Dictionnaire des Ouvrages Anonymes et Pseudonymes* of Barbier, 2d ed., 4 tom. 8vo (Paris, 1822–27). Italy, too, has the *Dizionario di Opere Anonime e Pseudonime di Scrittori Italiani* of Melzi, 3 vols. 8vo (Milano, 1848–59). Mr. Ralph Thomas's (Olphar Hamst) *Handbook of Fictitious Names* (London, 1868, 8vo), a slight and tentative, though useful production, is the only work yet published on the anonymous and pseudonymous literature of Britain; but Mr. Halkett, formerly keeper of the Advocates' Library, Edinburgh, has left extensive collections on this subject, which are being arranged and supplemented by the rev. John Laing, of the New College Library, Edinburgh. Recent additions to this branch of B. are Weller's *Maskirte Literatur der älteren und neueren Sprachen*, 1ter Theil; *Index Pseudonymorum* (1856), 2ter Theil; *Die falschen und fingirten Druckorte* (1858).

Bibliographies which describe treatises on special subjects are very numerous; we have only space to notice the following: Lipenius, *Bibliotheca Realis Theologica*, 2 vols. folio (Francofurti, 1685); *Bibliotheca Philosophica*, 1682; *Bibliotheca Medica*, 1679; *Bibliotheca Juridica*, 1672—a new edition of the last of these was published at Leipsic in 1757, and supplements have been successively added by Scott, Senkenberg, and Madihn—Marvin's *Legal Bibliography*, 8vo (Phila. 1847); Orme's *Bibliotheca Biblica*, 8vo (Edin. 1824); Fürst's *Bibliotheca Judaica*, 8vo (Leip. 1849–51); Vater, *Litteratur der Grammatiken, Lexica und Wörtersammlungen aller Sprachen der Erde*, 2te Ausg. von B. Jülg, 8vo (Berlin, 1847); Upcott's *Bibliographical Account of the Principal Works relating to English Topography*, 3 vols. 8vo (Lond. 1818); Oettinger's *Bibliographie Biographique Universelle*, 8vo (Bruxelles, 1854); *The Literature of Political Economy*, by J. R. M'Culloch, 8vo (Lond. 1845); *Arithmetical Books from the Invention of Printing to the Present Time*, by Augustus de Morgan, 12mo (Lond. 1847); the *Biographia Dramatica*, by Baker, Reed, and Jones, 3 vols. 8vo (Lond. 1812); and the *Bibliotheca Anglo-poetica*, 8vo (Lond. 1815).

As examples of other works not included in the above classification, we have only space to mention Van Praet's *Catalogue des Livres Imprimés sur Vélin*, 9 vols. 8vo (Paris, 1822–28); Peignot's *Dictionnaire des Livres condamnés au Feu*, 2 vols. Paris, 1806;

and Martin's *Bibliographical Catalogue of privately printed Books*, 2d ed., 8vo (Lond. 1824.)

Further information will be obtained from an excellent bibliography of bibliographies, Petzholdt's *Bibliotheca Bibliographica* (Leipzig, 1864, 8vo).

BIBLIOMANCY (Gr. *ta biblia*, the Bible, and *manteia*, divination), a mode of divination much practiced during many ages, by opening the Bible, and observing the first passage which occurred, or by entering a place of worship and taking notice of the first words of the Bible heard after entering it. The application was often very fanciful, and depended rather upon the mere sound of the words than upon their proper signification, or the scope of the passage. Prayer and fasting were sometimes used as a preparation for a mode of consulting the divine oracles, than which nothing could be more contrary to their purpose and spirit, and which was in harmony only with the notions and practices of heathenism. B. was prohibited, under pain of excommunication, by the council of Vannes, 465 A.D., and by the councils of Agde and Orleans in the next century. It continued, however, to prevail for many centuries thereafter, and is said to have been introduced into England at the Norman conquest. It was essentially the same as the *Sortes Virgilianæ*, the only difference being in the book employed.

BIBLIOMANIA, or book-madness, is a word recently formed from the Greek to express the passion for rare and curious books, which has manifested itself to such an extent during the last century. While the ordinary collector is satisfied with the possession of works which are valuable either on account of their established reputation, or as assisting him in his literary or professional pursuits, the bibliomaniac is actuated by other motives. With him utility is of secondary importance, rarity being the first and great requisite. Thus even a common book becomes valuable in his eyes, if it be one of a few copies thrown off on vellum or on large paper, or if it has been bound by Derome, Bozerian, Lewis, or Payne; and for the same reason, he sometimes prefers an inferior to a better article. The fac-simile reprint of the Giunta edition of Boccaccio's *Decameron* (Florence, 1527) fetches hardly as many shillings as the original does pounds, yet the great distinguishing difference between them is, that the former is the handsomer and more correct of the two.

The formation of complete sets of such books as the *Elzevir Republics* (see ELZEVIR), or of the works of a single author, provided they be scarce, is a favorite pursuit with many. The editions of the classics most prized by collectors are those of the Elzevirs and of the Foulises (q.v.). The original editions of Defoe's numerous productions are eagerly sought for at present.

B. seems to have reached its climax at the sale of the library of the duke of Roxburghe in 1812. Amongst the treasures which that library contained, was the only perfect copy, known to exist, of the first, or at least the first dated edition of Boccaccio's *Decameron* (Venice, Christ. Valdarfer, 1471). After a spirited competition with lord Spencer, this volume was purchased by the marquis of Blandford for the sum of £2260, the highest price perhaps ever paid for a single book. When the collection of the marquis came under the hammer in 1819, lord Spencer secured this precious tome at the large yet more moderate cost of £918 15s. It is now, we believe, in his lordship's library at Althorp.

One of the results of the Roxburghe sale was the establishment of the Roxburghe club, the object of which was to reprint, for the use of the members only, works hitherto unedited, or of extreme rarity. The example thus set was speedily followed by the Bannatyne and Maitland clubs in Scotland, and by many more in other parts of the kingdom. Some of these are defunct, and others are in a moribund state. It remains to be seen in what new form the B. of the present day will develop itself.

BICANE'RE, capital of the protected state of the same name (see BIKANIR) in Rajpootana, India, lies in a desolate tract, 1175 m. to the n.w. of Calcutta, in lat. 28° n., and long. 73° 22′ east. Pop. about 60,000. It is surrounded by a battlemented wall of 3½ m. in circuit; and from a distance presents a magnificent appearance, but inside, the people are found to be extremely filthy. Immediately to the n.e. is a detached citadel, of which the rajah's residence occupies the greater part.—The state of which B. is the capital, lies in lat. 27° 30′ to 29° 55′ n., and long. 72° 30′ to 75° 40′ e., thus measuring, in its extremes, 160 m. by 200. It contains 17,676 sq.m., with an estimated population of 540,000. The Rajpoots are the predominant race; but the Jauts form the great body of the inhabitants. Though the people find their principal resource in pasturage, yet water appears to be remarkably scarce. In the whole territory, there is not one perennial stream; while wells, as precarious and scanty as they are brackish and unwholesome, average perhaps 250 ft. in depth; even the lakes or *sirris*, which the periodical rains leave behind them, are generally saline, yielding, in fact, at the close of the dry season, a thick crust of salt. In 1868–69, nearly the half of the population was destroyed by drought. The temperature varies greatly: in the beginning of Feb., ice is formed on the ponds; and in the beginning of May, the thermometer stands at 123° F. in the shade. Again, in the beginning of Nov., according to Elphinstone's experience, each period of 24 hours, according as the sun was above or below the horizon, presented such extremes of heat and cold as often to be fatal to life.

BICE (Ger. *beis*, Ital. *biadetto*), the name of two pigments of a blue and green color respectively, known to artists from the earliest times—blue B. as *mountain blue, ongaro, azzuro di terra*, etc.; and green B. as *chrysocolla, Hungarian green, verde de Miniera, verde de Spagna, verdetto*, etc. Green B. is now usually called *malachite green* and *mountain green*. Both are native carbonates of copper, but are also prepared artificially. In its native state, however, B. is more durable, and in the case of mountain green especially, much more brilliant. Artificial blue B. is known as Hambro' blue, mineral blue, etc.; artificial green B., as mountain green, Paul Veronese green, and emerald green.

BICEPS (double-headed) is the muscle which gives a full appearance to the front of the arm. Above, it consists of two portions or heads—whence its name—one being attached to the coracoid process of the scapula, the other to the margin of the depression on that bone which lodges the head of the humerus. The former is the short, the latter the long head of the biceps. They unite to form a fleshy belly, which terminates in a rounded tendon.

The B. tendon is inserted into the tubercle of the radius (see ARM). Before passing to this insertion, it gives off an expansion, which separates the median basilic vein from the brachial artery in the situation generally selected for venesection. The action of the B. is rapidly to bend the fore-arm, and also to supinate the hand.

BICÊTRE, originally the name of a very old castle, situated on a little eminence in the neighborhood of Paris, and commanding one of the finest views of the city, the Seine, and the environs. In 1632, it was destroyed, because it had become a hiding-place of thieves. Afterwards, it was rebuilt by Louis XIII., and made a hospital for old soldiers. When Louis XIV. had built the *Hôtel Royal des Invalides*, the B. was made a civil hospital for septuagenarians. It was for a long time used also as a prison for criminals, mostly those condemned to the galleys, but is now entirely occupied as a hospital for indigent old people and for incurable lunatics. There is a well sunk in the rock to the depth of 183 feet.

BICHAT, MARIE FRANÇ. XAVIER, one of the most famous anatomists and physiologists, whose discoveries make an epoch in biology, was b. at Thoirette, in the department of Ain, France, Nov. 11, 1771. He studied chiefly in Paris under Desault, who adopted him as his son, and whose surgical works he edited. In 1797, he began giving lectures on anatomy, along with experimental physiology and surgery, and in 1800 was appointed physician in the Hôtel-dieu. Two years after, July 22, 1802, he fell a victim to intense and unremitting labor, before he had completed his 31st year. He was the first to simplify anatomy and physiology by reducing the complex structures of the organs to the simple or elementary tissues (q.v.) that enter into them in common. This he has done in his *Anatomie Générale* (2 vols., Par. 1801, often reprinted). In his *Recherches Physiologiques sur la Vie et la Mort* (Par. 1800), he develops another luminous idea—the distinction between the organic and the animal life.

BICKERSTAFF, ISAAC, author of numerous comedies and light musical pieces produced under Garrick's management, which had at one time a great popularity, was b. in Ireland about the year 1735, and became page to lord Chesterfield, who was made lord lieutenant of Ireland in 1746. B. afterwards became an officer of marines, but was dismissed the service for some discreditable offense. Nothing is certainly known regarding his after-life, nor the time of his death, which would seem to have taken place on the continent. His best known pieces are *The Maid of the Mill; The Padlock; He would if he could; Love in a Village; The Hypocrite;* and *The Captive.*

BICKERSTETH, Rev. EDWARD, an influential clergyman of the church of England, was b. at Kirkby Lonsdale, in Westmoreland, Mar. 19, 1786. He commenced life as a post-office clerk; and afterwards, having served an apprenticeship to a London attorney, established a lucrative solicitor's business in Norwich. Here, he took great interest in all meetings of a religious nature, and soon became so deeply impressed with the importance of religious truth, that he resolved to devote himself to the ministry. Being admitted to orders, he was sent by the church missionary society to reorganize their mission stations in Africa. Having most satisfactorily accomplished his mission, B. was, on his return, appointed secretary to the church missionary society, and continued to discharge the duties of the office with unwearied energy and devotion that won for himself a high reputation and extensive influence, as well as great prosperity for the institution he represented, until 1830, when he resigned on acceptance of the rectory of Watton, in Hertfordshire. Here, until his death, which took place Feb. 24, 1850, he took an active part in promoting, both by tongue and pen, almost every work having for its object the spread of religious truth whether at home or abroad. B. belonged to what is known as the evangelical section of the church of England, and took a decided part against the endowment of Maynooth, and in opposition to the spread of tractarianism in his own church. He was also one of the founders of the evangelical alliance. Of his religious writings—which have been collected in 16 vols. (Lond., 1853)—the most popular are, *A Help to the Study of the Scriptures* (written before he was ordained), *The Christian Student*, and *A Treatise on the Lord's Supper*. B. also edited *The Christian Family Library*, a work consisting of 40 vols.

BICKERSTETH, EDWARD HENRY, b. England, 1825; son of Edward; educated at Cambridge; curate in 1848 in Birmingham, and since then in several places; rector, and latterly private chaplain to the bishop of Ripon. Among his works are *The Rock of Ages, or Scripture Testimony to the One Eternal Godhead of the Father, of the Son, and of the Holy Spirit, The Blessed Dead, The Risen Saints, Hades and Heaven, The Spirit Life, The Shadowed Home and the Light Beyond*, and several long and short poems. He is best known in this country by his long poem *Yesterday, To-day, and Forever*, which has won great admiration, with some adverse criticisms.

BICYCLE, a form of velocipede or lightly-built wheeled vehicle propelled by the person who occupies it. The bicycle, as its name (from Gr. *bis*, twice, and *kyklos*, wheel) imports, has but two wheels; and as these are placed in line one behind the other, the machine acquires and retains its stability in the erect position only in motion. The front wheel of the bicycle is generally about twice as high as that behind, and may be as much as 60 in. in diameter. The two wheels are connected by a "backbone" which rests in front on a forked bar rising perpendicularly from the axle of the front wheel. The rider, sitting on a saddle fixed to the backbone, moves the bicycle with his feet by means of cranks attached to the axle of the front or driving wheel, and steers by help of a cross-handle affixed to the erect bar. The bicyclist may without undue exertion attain a pace of 9, 10, or more m. an hour, and can sustain this pace for many hours. As much as 106 m. have been accomplished in less than eight hours. The whole machine, though now made almost wholly of steel and iron, need not weigh more than 50 pounds. The earliest form of bicycle introduced from France about 1820, had two heavy wooden wheels of the same size, and was driven by the rider striking his feet on the ground.

BICYCLE (*ante*), a machine for human locomotion, consisting of two wheels connected by a single bar; the forward wheel having a diameter of 30 to 60 in., the rear wheel, directly behind the other, being about one third as high. At first these machines were made with wheels of the same size, or nearly so; but no satisfactory speed was obtained until Parisian builders hit upon the device of a small hind wheel. That which was little better than a child's velocipede was by this improvement raised to the respectability of an important means of locomotion, and the speed already attained is wonderful. On fairly level roads that are in good repair, an expert rider can outdo a fast horse within an hour or so. In England some remarkable performances are recorded. A hundred miles a day for several successive days have been traversed; the space between Tunbridge and Liverpool, 234 m., in 18 h. 35 min.; the journey from London to John o' Groat's, more than 800 m., over hilly and often bad roads, in 14 days. The bicycle for fast travel has a large forward or driving wheel, which the rider can fit his legs to. The larger the wheel, the greater the speed to be obtained. The rider's feet, that give the motive power, rest on stout cranks placed at right angles, so that in working the machine his legs nearly imitate the act of rapid walking or running. He is seated on a little saddle just behind the large wheel, and guides his course by a bar with double handles. By this crank he swerves the forward wheel at will, and the expert can make sharp curves, and perform many surprising feats of gyration. The first thing to be learned is balancing, and that is best achieved by trying short trips down a slight incline. When balancing is accomplished and steering mastered, practice will soon make a rapid rider. In the bicycle for service there is or should be a rest for the feet, since in going down hill there is little work for the cranks or treadles. The B. is not only a pleasant and cheap means of travel, but it adds the zest of good exercise, and is therefore growing in favor in this country. A good bicycle ought to have india rubber tires, to prevent jolting, to be made of the strongest material, and to weigh only about 50 lbs. For speed, the forward wheel, made as large as the rider can manage, is usually from 48 to 60 in. in height. Of this machine there are two general styles: the "racer," built very light for speed, and the "roadster," heavier for steady service.

BIDA, a large inland t. in Africa, 9° 5′ n., 6° 5′ e., 16 m. n. of the Niger; the capital of the kingdom of Nufe.

BIDASSO'A, a river which, rising in Spain, forms the boundary between that country and France, and falls into the bay of Biscay at Fuenterabia. The treaty of the Pyrénées was concluded on an island in its mouth in 1659. The B. was the scene of several conflicts during the Spanish campaign. In April, May, and June, 1793, the Spanish crossed the river, and defeated the French, who occupied a line extending from St. Jean Pied-de-Port to the mouth of the B., in three successive encounters, capturing a considerable quantity of ammunition and several pieces of cannon. In July of the following year, however, the French captured the intrenched camp and all the fortified posts of the Spaniards—defended by 200 pieces of cannon—on the river. Napoleon, in June, 1811, had a *tête-du-pont* constructed on the B. at Irun. In Aug., 1813, the French under Soult were defeated at San Marcial on the B. by the allies; and in the Oct. of the same year, Wellington surprised and drove the French from their strongly fortified positions on its northern side.

BID'DEFORD, a city in Maine on the Saco, 9 m. from its mouth, and 15 m. s.w. of Portland, on the Boston and Maine, and the Portsmouth, Saco, and Maine railroads;

pop. '70, 10,282. B. was settled in 1616–17, by Richard Vines, when York county comprised the whole province of Maine. The main business is manufacturing, and the exportation of a superior quality of granite.

BIDDING PRAYER is a form of exhortation, always concluding with the Lord's prayer, enjoined by the 55th canon of the Anglican church, in 1603, to be used before all sermons and homilies. Except in cathedrals and the university churches, it is now but seldom used. The term "B." is from the Saxon "Bede," signifying a prayer. The form is of extreme antiquity, and we have a similar one in the apostolical constitutions (q.v.), the original of which was probably that used in the church of Antioch. It was anciently used for the communicants or believers after the dismissal of the catechumens, and was pronounced by the deacon, each petition beginning with the words, "Let us pray for ——," and the people responding at the end of each with "Kyrie Eleeison," or some such words.

There is another very ancient example in the Ambrosian liturgy; and St. Chrysostom alludes to such a form in one of his sermons. It must have been, and even now in its abridged shape still is, very impressive, allowing each individual to supply from his own thoughts special cases of necessity under the different heads. There is some resemblance between these B. prayers and the Litany, and prayer for the church militant, now used in the Anglican church.

BIDDLE, CLEMENT, 1740–1814; b. Philadelphia; a Quaker, but a soldier, who raised a corps for the protection of friendly Indians against the outlaws known as "Paxter boys." In the beginning of the revolution he was an officer in the Quaker volunteers, and was made deputy quartermaster-general. He took part in the fight at Trenton, where he secured the resigned swords of the Hessian officers. He was also at Princeton, Brandywine, and Germantown, and rendered valuable service in the terrible winter of 1777–78 at Valley Forge. In 1794, he went against the whisky insurrection. Washington thought highly of B., and made him U. S. marshal for Pennsylvania.

BIDDLE, CLEMENT CORNELL, son of Clement, 1784–1855. He was in the navy when young, but left it for the law. In the second war with England he was capt. of dragoons and col. of volunteers. He is best known by his notes and additions to the translations of Say's *Treatise on Political Economy*. He was prominent in the national free-trade convention of 1831.

BIDDLE, JAMES, b. Philadelphia, 1783–1848; an American naval capt.; served as midshipman in the war with Tripoli, where he was made prisoner and kept until the peace. He was lieut. on the *Wasp*, which captured the British *Frolic* early in the war of 1812, and was put in command of the prize, but both were captured by the *Poictiers* and taken to Bermuda. Exchanged in 1813, he served on the *Hornet*, in command of which he sailed for the East Indies, captured the *Penguin*, and was wounded in action. Congress gave him a gold medal and the rank of captain. In later years he was a commissioner to make a treaty with Turkey.

BIDDLE, JOHN, the founder of English Unitarianism, was b. in 1615, at Wotton-under-Edge, in Gloucestershire, and in 1632 entered Magdalen college, Oxford, where he took his degree of M.A. In 1641, he was elected master of the free school in the town of Gloucester, the duties of which function he discharged with such zeal, that the character of the institution was greatly improved; but having embraced certain opinions—which he printed for private circulation—in regard to the personality of the Holy Spirit, at variance with those held by the majority of Christians, he was thrown into jail, Dec., 1645. Being at length summoned before the parliament at Westminster, on account of his heresy, he was formally tried, and condemned to imprisonment for 5 years. The famous Westminster assembly of divines undertook to "settle" B.'s case, but unfortunately their arguments—as is usual in disputation—had only the effect of strengthening his previous convictions. In 1648, while still in prison, he published a *Confession of Faith concerning the Holy Trinity*, etc., which was followed by another tract containing the opinions of the church fathers on the same question. In consequence of this attempt to combat the orthodox doctrine, the Westminster divines called upon the parliament to pass an act declaring the denial of the Trinity a crime punishable by death. The *army*, however, strange to say, proved on this occasion less cruel than the *church*, for it manifested such strong opposition that the act remained a dead-letter. Under the liberal rule of Cromwell, B. was released. He now commenced to gather a congregation of those whom he had converted to his opinions—namely, that there was but one person, as there was but one nature, in the Godhead. The members were first called Bidellians, then Socinians, and finally assumed for themselves the name of Unitarians. Twice, however, after this, during the commonwealth, B. suffered severely for his creed, and even the iron-willed protector himself, in order to save his life, was compelled to banish him to one of the Scilly isles. Three years of imprisonment having elapsed, he was permitted to return, and continued to preach in London till the death of Cromwell, and also after the restoration, until June, 1662, when he was again apprehended and fined in £100, and being unable to pay, was committed to jail, where he died in Sept. of the same year. His personal character was highly esteemed by those who knew him.

BIDDLE, NICHOLAS, b. Philadelphia, 1750; killed by an explosion at sea, 1778. When but 15 years of age he was left on an uninhabited island of the West Indies, where he remained two months. In 1770, he entered the English navy, and served as a seaman on Nelson's vessel in capt. Phipps's exploring expedition. In the revolution he joined the Americans and commanded a small brig in the attack on New Providence; in 1776, captured two British transports with valuable cargoes and a battalion of Highlanders; as commander of the *Randolph* he took four prizes, and received command of a fleet to cruise in the West Indies, where he was wounded in an engagement with the *Yarmouth*. While he was in the hands of the surgeon the magazine blew up, and of 315 men all but four were killed.

BIDDLE, NICHOLAS, an American financier, b. at Philadelphia in 1786, graduated at Princeton college, and became an energetic member of the legislature of Pennsylvania. In 1823, he was appointed president of the U. S. bank, and held that post till 1839. He conducted its affairs at first with great skill, integrity, and prudence; but in 1838, the bank became insolvent, and in Oct. of that year suspended cash payments. The commercial panic and distress which at that time prevailed in the United States, spread dismay far and wide, and involved multitudes in ruin. In Dec., 1841, the grand jury for the county of Philadelphia made a presentment against B. and some others for entering into a conspiracy to defraud the stockholders of the bank of $400,000 in 1836, and endeavoring to conceal the same by a fraudulent and illegal entry in 1841; the presentment, however, was never followed up. B. had considerable literary taste, and for some time edited the *Philadelphia Portfolio*, contributing many articles to its pages. By request of the president of the United States, he compiled from the original papers a *History of Lewis and Clarke's Expedition to the Pacific Ocean;* also *The Commercial Digest*, a volume put forth by congress. A number of his essays, speeches, etc., were published. He died in Jan., 1844.

BIDDLE, RICHARD, 1796–1847; brother of the president of the U. S. bank, a lawyer and leader of the Pittsburgh bar. He published a *Review of Capt. Basil Hall's Travels in North America*, and a *Memoir of Sebastian Cabot, with a Review of the History of Maritime Discovery*. In 1837-40, he was a member of congress.

BIDEFORD, a seaport t. of Devonshire, on both sides of the Torridge, near its confluence with the estuary of the Taw, 30 m. n.w. of Exeter. A bridge of 24 arches, and 677 ft. long, unites the two divisions of B., which has manufactures of ropes, sails, earthenware, and leather. These it exports, together with oak-bar, corn, flour, linens, woolens, iron, and naval stores. Pop. '71, 6969. In 1875, 103 vessels, of 6776 tons, belonged to the port; and 813 vessels, of 37,620 tons, entered, and 215 vessels, of 10,848 tons, cleared it. Vessels of 500 tons can get up to the quay in the center of the town. Sir R. Granville, the discoverer of Virginia, was born in Bideford.

BIDPAI, or PILPAI, is the reputed author of a collection of fables and stories which have been widely current both in Asia and Europe for nearly 2000 years, passing as a compendium of practical wisdom. Scarcely any book except the Bible has been translated into so many languages; and its history deserves attention as part of the history of human development. The researches of Colebrooke, Wilson, Sylvestre de Sacy, and Loiseleur des Longchamps (*Essai sur les Fables Indiennes*, 1838) have successfully traced the origin of the collection, its spread, and the alterations it has undergone among different nations. The ultimate source is the old Indian collection in Sanscrit, with the title *Panchatantra* (q.v.), i.e., "Five Sections" (edited by Kosegarten, Bonn, 1848). An analytical account of the Sanscrit *Panchatantra*, by H. H. Wilson—who determines the date of its production to be subsequent to the 5th c. A.D.—is printed in the *Transactions* of the royal Asiatic society, vol. i.; but an abridgment of it, called the *Hitopadesa* (q.v.), is better known than the original. A critical edition of the *Hitopadesa* has been published by A.W. von Schlegel and Lassen (Bonn, 1829), and translations have been made into English by Wilkins and Jones, and into German by M. Müller (Leip. 1844).

Under the Persian king, Nushirvan (531–79), the *Panchatantra* was translated into the Pehlvi tongue by his physician Barsuyeh, under the title of *Calilah and Dimnah* (from two jackals that take a prominent part in the first fable). This Pehlvi version has perished with all the profane literature of ancient Persia; but under the caliph Almansur (754–75), it was translated into Arabic by Abdallah-ibn-Almokaffa (published by De Sacy, Par. 1816). From Almokaffa's Arabic translation—in the introduction to which the author of the collection is called Bidpai, the chief of Indian philosophers—have flowed all the other translations and paraphrases of the east and west. Several Arabic poets worked it up into complete poems; and in the new Persian literature a great variety of versions and paraphrases, some in verse, some in prose, were made. From the Persian of Vaez (about the end of the 15th c.), the work was translated into Turkish about 1540 by Ali Chelebi, under the title of *Homayun-nâmeh*, the imperial book. There are also translations into the Malay, Mongol, and Afghan languages.

Towards the end of the 11th c., a translation had appeared, from the Arabic of Almokaffa, into Greek, by Simeon Sethus; and later, a Hebrew translation by Rabbi Joel, which John of Capua, a converted Jew, in the last half of the 13th c., retranslated into Latin with the title of *Directorium Humanæ Vitæ* (published first at Augs. 1480, and

repeatedly since). A version from this was made into German by Eberhard I., duke of Würtemberg (died 1325), which appeared with the title of *Examples of the Ancient Sages* (Ulm, 1483). Under Alfonso X. of Castile (1252–84), Almokaffa's work was translated into Castilian, and afterwards from that into Latin by Raymond of Veziers, a learned physician. The other European translations follow, some the Latin of John of Capua, some that of Raymond of Veziers; Spanish (Burgos, 1498), Italian (Flor. 1548), English (Lond. 1570), Dutch (Amst. 1623), Danish (Cop. 1618), Swedish (Stock. 1743), German (most recent, Leip. 1802).

BIEFVE, EDOUARD DE, b. 1808; a Belgian painter who studied with David d'Angers. He excels in portraits and historical compositions. By order of the government he produced the "Compromise of the Brussels Nobles of Feb. 16, 1566," which was greatly praised at the Paris exhibition of 1855. Some of his other works are "The Introduction of Rubens to Charles V.," "Massaniello," "Ugolino," "Raphael and La Fornarina," and "The Knights of the Teutonic Order recognizing the Elector of Brandenburg as their Grand Commander," done for the king of Prussia.

BIEL. See BIENNE.

BIEL, GABRIEL, b. about the middle of the 15th century. He was pastor at Mainz, and on the establishment of the university of Tübingen, in 1477, was appointed professor of theology, and twice afterwards rector. He was a follower of William of Occam. His work *Collectorium Super Libros Sententiarum G. Occami*, is a clear account of the nominalistic doctrine, and presents a complete system of scholastic thought regarded from that point of view. B. has been erroneously called "Ultimus Scholasticorum" (the last of the scholastics). He died in 1495.

BIELA, WILHELM VON, 1782–1856; a German astronomer and soldier, and major in the Austrian army; celebrated as the discoverer of a comet named after him, and for contributions to Schumacher's *New Astronomy*.

BIELA'S COMET, one of the comets of short period, named from its investigator, Wilhelm von Biela. Its periodic time is 6617 years. Its orbit was first determined on its appearance in 1826, and it was found to have been seen in 1772 and 1805. On its return in 1846 it was in two parts, separated by about 157,000 m., unequal in size, each having a distinct nucleus and tail. At the return in 1852, the parts were 1,250,000 m. asunder. Since then it has not been seen. It has been suggested that its orbit has crossed that of a meteoric shower, and that it has been broken up and dispersed as material for shooting stars.

BIELAU, a t. in Prussia, called LANGEN BIELAU, being the longest village (4 m.) in the state. It is important for cotton and other manufactures, and boasts of one old castle. Pop. '71, 13,070.

BIELEFELD, a busy t. of Westphalia, in Prussia, picturesquely situated on the Lutter or Lutterbach, at the foot of the Sparrenberg mountain, and about 26 m. s.w. of Minden. The broad ditch, which formerly surrounded B., is now converted into pleasant walks. The old walls of the town have been put to a similar use. The castle of Sparrenberg, erected in 1545 on the site of an old Guelphic fortress, and which now serves as a prison, is in the immediate neighborhood. B., which is the center of the Westphalian linen-trade, has extensive bleaching-grounds, manufactures of woolen thread, soap, leather, etc., and its meerschaum pipes are celebrated. Pop. '75, 26,574

BIËLEV', an ancient t. of European Russia, in the government of Tula, situated on the left bank of the Oka, in lat. 53° 45′ n., and long. 36° 5′ east. It has a large trade, and manufactures of soap, hardware, leather, etc. Pop. '67, 8123.

BIELITZ, a t. of Austrian Silesia, on the left bank of the river Biala, about 18 m. n.e. of Teschen. A bridge over the river connects it with the town of Biala, which is situated in Galicia. It has dye-works and print-fields, and carries on a large trade in woolens and kerseymeres with Russia, Poland, Hungary, and Italy. B. belongs to the princes Sulkowsky, whose castle, now converted into public offices, is situated here. Pop. '69, 10,721.

BIËLLA, a t. of n. Italy, in the province of Novara, about 38 m. n.e. of Turin, with which it is connected by railway. It is pleasantly situated on the Cervo, an affluent of the Sesia, and has manufactures of woolens, hats, paper, etc. Pop. with suburbs, '71, 11,814.

BIË'LO-OZ'ERO (the White lake), a lake in the government of Novgorod, Russia, lat. 60° 10′ n., long. 37° 30′ east. It is elliptical in shape, its length being about 25 m., and its breadth 20. Its bottom is composed of white clay, which, during stormy weather, gives to the water a milky appearance; hence, doubtless, the name White lake. B. is fed by numerous small streams, is pretty deep, and abounds with fish. Its surplus waters are conveyed by the Sheksna river into the Volga. Canals unite it with the Onega, Sukona, and Dwina.—B. OZERSK, an old wooden t. on the s. shore of the lake, formerly capital of an ancient principality of the same name, has a trade in cattle, corn, and pitch, and manufactures of candles. Pop. '67, 4467.

BIËLO'POL, a t. of Russia, in the government of Kharkov, and distant from the city of that name 106 m. n.w. It has a considerable trade and extensive distilleries. Pop. '67, 12,178.

BIELSHÖH'LE, a singular cavern in one of the Harz mountains, called Bielstein, on the right bank of the Bode, in the duchy of Brunswick, Germany. It was discovered in 1768. The entrance to it is more than 100 ft. above the bed of the stream. The cavern is divided into 11 main compartments, and contains a great deal of that curiously freakish work which nature delights to execute in stalactites, when she sometimes condescends to imitate the inventions of human art, as in the eighth division, where she has contrived to fashion the framework of an organ out of the slow drip of ages. In the ninth, there is also a picture of a sea, as it were, arrested in its motion, its waves silent, but in act to roll.

BIËLSK, a t. of Russia, in the government of Grodno. It is situated in a very fertile district, watered by the Narev and Nurzek, was formerly capital of a Polish palatinate, is well built, and has a fine custom-house. Pop. '67, 3985.

BIENHOA, a t. in Cochin China, capital of a province, 20 m. n.w. of Saigon, connected with that city by a canal. B. was taken by the French in 1861, and is now one of their fortified posts. Pop. of the "inspection" of B., 19,260.

BIENNE, or BIEL, a t. of Switzerland, in the canton of Bern, 17 m. n.w. of the city of Bern, beautifully situated at the foot of the vine-clad Jura, at the mouth of the valley of the Suze, and at the northern extremity of the lake of Bienne. It is surrounded by old walls, and approached by shady avenues. Pop. '70, 8113, engaged in the manufacture of watches, leather, cotton, etc. B. is a place of great antiquity. It belonged to the bishop of Bâle, or Basel; but as early as 1352, it entered into an alliance with Bern for the protection of its liberties, and for this display of independence was burned by its ecclesiastical ruler. The reformation, however, so weakened the power of the clerical governors of B. that in the beginning of the 17th c. it had become merely nominal; and B. was essentially a free and independent city until 1798, when it was annexed to France. In 1815, it was united to Bern.—B., LAKE OF, extends from the town of B. along the foot of the Jura mountains in a s.w. direction, until within 3 m. of lake Neuchâtel, its length being about 10 m., and its greatest breadth 3. It is situated at an elevation of 1419 ft. above the level of the sea, 8 ft. lower than lake Neuchâtel, whose surplus waters it receives at its s. extremity by the Thiel, by which river it again discharges its own. Its greatest depth is 280 feet. Towards its southern extremity is situated the island of St. Pierre, crowned with a grove of fine old oaks, to which Rousseau retired for two months after his proscription at Paris in 1765.

BIËNNIALS, or BIENNIAL PLANTS, are plants which do not flower in the first season of their growth, but flower and bear fruit in the second season, and then die. Many of our cultivated plants are B., as the carrot, turnip, parsnip, parsley, celery, etc., and many of the most esteemed flowers of our gardens, as stock, wallflower, etc. But plants which in ordinary circumstances are B., often become annuals (q.v.), when early sowing, warm weather, or other causes promote the earlier development of a flowering stem, as is continually exemplified in all the kinds already named. If, on the other hand, the flowering of the plant is prevented—or, in many cases, if it is merely prevented from ripening its seed—it will continue to live for a much longer period: the same bed of parsley, if regularly cut over, will remain productive for a number of years.

BIENVILLE, a parish in n.w. Louisiana; 1050 sq.m.; pop. '70, 10,636—5047 colored. It produces corn, cotton, and sweet potatoes. Co. seat, Sparta.

BIENVILLE, JEAN BAPTISTE LEMOINE, Sieur de; 1680–1768; one of the four brothers who were conspicuous in the exploration and settlement of the French province of Louisiana. The others were Iberville, Sauvolle, and Chateaugay, all sons of Charles Lemoine. With Iberville and Sauvolle, B. went from France in 1698, and made the first settlement at Biloxi. Leaving Sauvolle in command, B. went to explore the country, and in 1700 built a fort 54 m. from the mouth of the Mississippi. The next year he succeeded Sauvolle as governor or director of the colony, fixing the seat of government at Mobile. Chateaugay joined him in 1704 with 17 settlers from Canada, and 20 women arrived from France to be married to the colonists. B. was dismissed in 1707, but his successor died at sea and left him still in authority. With a view to improve the cultivation of the soil he proposed to the French government the exchange of Indians for negro slaves, giving three of the former for two of the latter. About this time the colonists were sorely pressed by famine, and in 1712 the king granted the monopoly of trade to Anthony Crozat, with liberty to import negroes from Africa. In 1713, Cadillac was made governor, and B. kept as lieutenant-governor. They quarreled, and Cadillac sent B. against the warlike Natchez tribe, expecting that he would be killed but he made friends with the Indians, who built a fort for him. In 1718, B. was made governor, and with the aid of men sent out by Law's "Mississippi company" founded the city of New Orleans, which became the seat of government in 1723. Recalled the next year, he went to France to answer certain charges, leaving the colony a code regulating slavery, prohibiting all religious except the Roman Catholic, and banishing

Jews. In 1726, he was removed, but re-appointed in 1733, and made lieut.gen. In 1743, he was finally superseded, and he passed the remainder of his life in France.

BIERSTADT, ALBERT, b. Germany, 1829; in 1831, his family came to America and settled in New Bedford. Having a taste for drawing, he went to Dusseldorf to study, and made sketching tours in Switzerland and Germany. In 1858, he accompanied the Lander expedition to lay out a wagon road from Missouri to the Pacific, and on that and subsequent visits accumulated material for the landscapes on which his artistic fame securely rests. Some of his more notable works are "The Rocky Mountains," "The Domes of the Yosemite," "Storm in the Rocky Mountains," "Emigrants Crossing the Plains," and "Sunlight and Shadow." His recent work has been mainly in the same style, along the Pacific coast. In 1871, he was elected a member of the St. Petersburg academy.

BIERVLIET, a village of the Netherlands, province of Zeeland, 13 m. e.n.e. of Sluis. It is deserving of mention as the birthplace of William Beukelzoon (q.v.), who in 1386 invented the method of curing herrings. In 1377, B. was detached from the mainland by an inundation, and still remains insular.

BIES-BOSCH, a marshy sheet of water of the Netherlands, between the provinces North Brabant and South Holland, formed in Nov., 1421, by an inundation which destroyed 72 villages and 100,000 people, and forming that part of the estuary of the Maas called Holland's Diep. It is interspersed with several islands.

BIFFIN. See APPLE.

BIF-RÖST, or BIF-RAUST (the "tremulous bridge"), the rainbow, which in Norse mythology was deemed to be a bridge between heaven (asgard) and the earth, or some say hell (hela). In the latter time the warriors of Muspelheim (land of fire) ride over the bridge to give battle to Odin and his associate gods; the bridge breaks down; the wolf Fenrir, the Midgard serpent, Loki, and all the followers of Hel, and the frost giants unite in the war. There is nothing in heaven or earth that shall be exempt from fear in that terrible hour. All the gods led by Odin come forth to war. The evil powers triumph, and the whole universe will be consumed with fire.

BI'GA, a Roman term applied in ancient times to vehicles drawn by two horses abreast; and commonly to the Roman chariot used in processions or in the circus. In shape it resembled the Greek war-chariot—a short body on two wheels, low and open behind, where the charioteer entered, but higher and closed in front.

BIGAMY. This is an offense which, although perfectly intelligible in itself to the popular and unprofessional understanding, is yet, with a due regard to the strict meaning of the word, extremely difficult, legally, to define. Blackstone objects to the use of it as a term descriptive of the offense in view; for he says it is corruptly so called, because B. properly signifies being *twice married*, which a man or woman may legally be; and he therefore prefers the term *polygamy*. B., however, even according to the literal meaning, was an offense, or rather disqualification, according to the canonists, who explained it to consist in marrying two virgins successively, one after the death of the other, or in once marrying a widow; and persons so offending or disqualified were held to be incapable of holy orders, and therefore B. was anciently considered a good counterplea to the claim of *benefit of clergy* (q.v.), although the law in that respect was afterwards altered by a statute passed in the reign of Edward VI., when, bigamists or no bigamists, the clergy resumed their strange privilege. Different views prevailed in more modern times, and at a period, too, when the restraints of ecclesiastical dogmas had been thrown off. It is known that certain of the leaders of the German reformation, including Luther, Melanchthon, Bucer, and Melander, did not withhold their consent from Philip, landgrave of Hesse, champion of the reformation, who, having lost conceit of his wife, had applied to the Protestant doctors for license to have another, and which license was not withheld, for the marriage took place, and was performed by Melander in presence of Melanchthon, Bucer, and others; and *privately*, as the marriage-contract bears, "to avoid scandal, seeing that, in modern times, it has not been usual to have two wives at once, although *in this case it be Christian and lawful.*" Whether Luther and the other Protestant doctors actually held views favorable to polygamy has been the subject of warm controversy (see sir William Hamilton's *Discussions on Philosophy and Literature*, 1852, 2d ed., 1853; and archdeacon Hare's *Vindication of Luther*, 1855). Sir William Hamilton asserts that Luther believed in "the religious legality" of polygamy, and wished it to be sanctioned by the civil authorities—an assertion, however, of which the promised proof never appeared. Archdeacon Hare, on the other hand, maintains that Luther and Melanchthon only held that in certain extraordinary emergencies dispensations from the usual law of marriage might be granted. Be that as it may, the conduct of the reformation leaders in this matter has been universally condemned, even by Protestants. The ideas referred to never gained ground in Germany; while in Great Britain "monogamy" not only continued an institution, but its violation was regarded as a serious offense, which continues to be treated in statutes, law-books, and in the practice of the criminal courts in the three kingdoms, under the name of *bigamy*. Nor, indeed, have the ideas referred to been followed by the Germans as a nation.

The first statute which distinctly treated this offense as a felony was the 1 James I. c. 11, which enacted that a person so convicted should suffer death. What now constitutes the English law regarding the crime of bigamy, is the 22d section of 9 Geo. IV. c. 31, passed in 1828. B. is there declared to be committed by "any person who, being married, shall marry any other person during the life of the former husband or wife, whether the second marriage shall have taken place in England or elsewhere"—a definition that appears to be adopted by the recent divorce act, the 20 and 21 Vict. c. 85, where, for the purpose of that act, B. is to be taken to mean "marriage of any person being married, to any other person during the life of the former husband or wife, whether the second marriage shall have taken place within the dominions of her majesty, or elsewhere." More correctly, however, the offense of B. may be said to consist in going through the *form* or *appearance* of a second marriage, while a first subsists, with a man or woman, against whom the most odious deceit and fraud is thus practiced, and upon whom, especially in case of a woman, the deepest injury is inflicted; for the second marriage is merely a marriage in form—no real marriage at all, because a man cannot have two wives, or a woman two husbands, at one and the same time. In prosecutions under this act, the first wife is not admissible as a witness against her husband, because she is the true wife; but the second may, because she is not only no wife at all, but because she stands in the position of being the party peculiarly injured by the bigamy. The same is the procedure in the case of a second husband. The act following the 1 James I. makes B. a felony, and prescribes as the punishment, upon conviction, transportation for seven years; now changed (by the 16 and 17 Vict. c. 99, amended by the 20 and 21 Vict. c. 3) to penal servitude for the same period, or not less than three years; or to be imprisoned, with or without hard labor, in the common jail or house of correction for any term not exceeding two years.

The act, however, excepts from its provisions the following four cases: 1. That of a second marriage contracted out of England, by any other than a subject of the realm. 2. That of any person marrying a second time, whose husband or wife shall have been continually absent from such person for the space of seven years then last past; and shall not have been known by such person to be living within that time. 3. That of a person who, at the time of such second mariage, shall have been delivered from the bond of the first marriage. 4. That of a person whose former marriage shall have been declared void by the sentence of any court of competent jurisdiction. The third of these exceptions deserves notice, in consequence of its bearing on a curious question that arose before the passing of the act, and which showed a serious conflict which then existed, if it does not still exist, between the laws of England and Scotland. The case referred to is known among lawyers as *Lolley's case*; it occurred in 1812, and may be shortly stated as follows: Lolly and his wife, two English persons, being tired of each other's conjugal society, and unable to bear the expense of the then English ordeal, went to Scotland, where, after acquiring a domicile, they applied to the Scotch consistorial court for a divorce, which was speedily (although it is said collusively) obtained, on the ground of the husband's adultery. Relying on such sentence of the Scotch court, Lolly returned to England, where he married again. He was immediately indicted for B., tried, convicted, and sentenced to seven years transportation, and that in the face of the Scotch decree of divorce, which he reasonably pleaded by way of defense. The point, however, was reserved for further consideration before the full court (court of Exchequer), who, however, shortly after gave a unanimous judgment holding that Lolly had been rightly convicted; or, in other words, that the Scotch court had no authority to dissolve an English marriage, and that the decree of divorce which Lolly had obtained, although good in Scotland, was of no force whatever in England. Many distinguished English lawyers were of opinion that the judgment of the English court was wrong, and that the Scotch divorce afforded him a complete defense. But it is to be observed that the prosecution was founded on the 1 James I. c. 11, to which we have referred, the 3d section of which only excepts from its provision persons divorced by "any sentence had in the ecclesiastical court," meaning, of course, the English ecclesiastical court; and thus some color at least is given to the view taken of Lolly's case by the court of Exchequer. But it may well be doubted whether such a conviction could take place in the face of the above third exception in the 9 Geo. IV., which excepts persons who shall have been divorced, not by any particular court or jurisdiction, but simply divorced from the bonds of the first marriage.

It remains to be added that under the 9 Geo. IV., not only the actual bigamist, but every person counseling, aiding, or abetting the offender, is held equally guilty, and may be sentenced to the same punishment; and by section 31, accessories before and after the fact are also severely punishable.

The 9 Geo. IV. does not extend to Scotland, but the law there on the subject of this particular offense is very much the same in principle, although the punishment there is not so severe as in England. There is an old Scotch statute, passed in 1551, which declares the punishment of B. to be the same as that of perjury; but the offense is also indictable at common law in Scotland, and in modern practice, it is usual so to deal with it, and to limit the punishment to imprisonment. See MARRIAGE, DIVORCE, POLYGAMY.

BIGAMY (*ante*). In the United States the laws concerning B. are nearly the same as in England, and are drawn in the main from the statute 1 James I., c. 11,

except in the matter of penalty, which differs in different states. It has been held in Massachusetts that a woman may be punished if she marries another person while her lawful husband lives, although he may have left her of his own motion and remained away any time less than seven years. In some states the defendant in a successful case of divorce who marries again is guilty of B., being by statute forbidden to marry; but little regard is paid to this prohibition. Indeed, the statutes of the several states affecting marriage and divorce are so various and conflicting that prosecutions for bigamy are exceedingly rare.

BIG BETHEL, in the peninsula between York and James river, Va., where, June 10, 1861, an irregular and undecisive battle took place between the union forces and the confederates. After a series of blunders and skirmishes, in which maj. Theodore Winthrop was killed while leading an assault, a retreat was ordered by the union gen. in command. The union loss was about 100, that on the confederate side but seven or eight.

BIG BLACK RIVER, in Mississippi, is about 200 m. long, running through a fine cotton region near the middle of the state, and joining the Mississippi at Grand gulf.

BIG BONE LICK, a salt spring in Boone co., Ky., where many bones of the mastodon and other extinct mammalia have been found.

BIGELOW, Erastus Brigham, ll.d., 1814–79; b. Mass.; inventor of looms for weaving suspender webbing, piping cord, knotted counterpanes, carpets, coach laces, etc. He founded the manufacturing village of Clinton, Mass., the head-quarters of the Bigelow carpet company. B. proposed, in 1862, a plan for uniform taxation throughout the United States, and wrote an essay on the tariff considered in regard to the policy of England and the interests of the United States. He was one of the original incorporators of the Massachusetts institute of technology, a trustee of the museum of fine arts, a member of the American academy of arts and sciences, of the Massachusetts historical society, of the London society for the encouragement of arts, manufactures, and commerce; and received the degree of a.m. from several New England colleges.

BIGELOW, Jacob, b. Mass., 1787; physician and botanist; graduated at Harvard in 1806. In early life he became proficient in botany, and published two works on the science. He was for more than 40 years physician to the Massachusetts general hospital, and for a long time professor of materia medica and clinical medicine in Harvard. In 1820, he was one of the committee of five who formed the *American Pharmacopœia*, and assisted in establishing the nomenclature which substituted a single for a double word when possible. B. was the originator of mount Auburn cemetery, the first of the large and beautiful places of interment now so numerous in this country. Besides many books and papers on botany and medical subjects, he has published poems, etc., and a volume of verse, entitled *Eolopoesis*, is ascribed to him. For many years he was president of the Massachusetts medical society. Of late, since abandoning active practice, he has devoted much attention to technical education and the substitution of practically utilitarian branches for classical study.

BIGELOW, John, b. New York, 1817; graduated at Union college in 1835, admitted to the bar in 1839, and soon after became a casual journalist and editor. In 1850, he joined William Cullen Bryant in the New York *Evening Post*, and was one of its principal editors until 1861, when he was appointed consul at Paris. On the death of Mr. Dayton he became United States minister in France, remaining until 1866. He has published *Life of Fremont, Some Recollections of the late Antoine Pierre Berryer*, and *Les Etats-Unis d'Amerique*, the latter in Paris.

BIGELOW, Timothy, 1767–1821; an American lawyer; a graduate of Harvard; for 20 years a member of the Massachusetts legislature, and for more than half that time speaker of the house. He was also a member of the Hartford convention.

BIGG. See Barley.

BIG HORN, a navigable river of the United States, rises near Fremont's peak in the Rocky mountains, about 42° 20′ n., and 110° west. It has a n.e. course of about 400 m., being the largest affluent of the Yellowstone, which, again, is the largest affluent of the Missouri.

BIG HORN, a co in s.e. Montana, on the Dakota and Wyoming borders; about 30,000 sq.m.; pop. '70, 38 whites. It is intersected by the Yellowstone and some of its tributaries

BIGHT (from the same root as the verb "to bow") is a sailor's name for the bent or doubled part of a rope. Thus, one anchor may "hook the B." of the cable of another, and thereby cause entanglement. In geography, B. has much the same sense as "bay."

BIGNONIA'CEÆ, a natural order of exogenous plants, containing trees, shrubs, and herbaceous plants, generally with compound leaves. The flowers are generally showy, ane are among the most striking ornaments of tropical forests. The corolla is of one petal, generally more or less trumpet-shaped and irregular; the stamens are 5 in number, or 4, with the rudiment of a fifth, and unequal. The ovary is free, seated on a disk, 1 or 2-celled; the fruit sometimes capsular, sometimes drupaceous; with few or many seeds. There are about 500 known species; which, however, are often regarded as

forming three distinct orders—*bignoniaceæ*, *crescentiaceæ*, and *pedaliaceæ*. Of these the *bignoniaceæ* are by far the most numerous, and are almost all tropical or subtropical, although a few are found in the United States of North America. See TRUMPET-FLOWER. They are in many cases noble trees, and some of them afford valuable timber, among which are *bignonia leucoxylon*, a tree of Jamaica, the green or yellow wood of which is sometimes brought into the market under the name of ebony; and the ipe-tobacco and ipe-una of Brazil, species of the same genus, the former of which is used for ship-building, and the latter is accounted the hardest timber in Brazil. Not a few of them are climbing shrubs, and the tough shoots of *bignonia cherere* are used for wicker-work in Guiana. *Bignonia alliacea*, a native of the West Indies, is remarkable for its strong alliaceous smell; the leaves of *bignonia chica* afford the red coloring matter called chica (q.v.).—The *crescentiaceæ* chiefly abound in Mauritius and Madagascar. The calabash tree (q.v.) is the best known example.—The *pedaliaceæ* are tropical or subtropical; many of them herbaceous plants. The most important is Sesamum (q.v.). The fleshy sweet root of *craniolaria annua* is preserved in sugar as a delicacy by the Creoles.

BIG SANDY RIVER, a fine navigable affluent of the Ohio, flows through extensive beds of coal. It is formed by the junction of two branches—the east and west forks—which both rise in Virginia. The latter traverses several counties of Kentucky, and the former is, during the latter part of its course, the boundary between the two states. Their united waters lose themselves in the Ohio, nearly opposite to Burlington, in the state of Ohio.

BIG STONE, a co. in s.w. Minnesota, on the Minnesota river and the Dakota border; 450 sq.m.; pop. '80, 3,689. Co. seat, Ortonville.

BIHACH', or BICHACZ', one of the strongest fortress towns of Turkish Croatia, in Bosnia, is situated on an island in the Una, in lat. 44° 42′ n., and long. 15° 53′ e., near the frontier of Dalmatia. It has been the scene of frequent contests during the Turkish wars. Formerly, it was possessed of a Christian church, but that has been completely destroyed by fanatic Mussulmans. Pop. 3000.

BIHAR, a co. in Hungary, e. of the Theiss; 4280 sq.m.; pop. '70, 557,337, mainly Magyars and Wallachians. The soil is generally fertile, and the people are rich in horses, cattle, and sheep. Gross-Wardien and Debreczin are the largest towns.

BIJANAGHUR' meaning, it is said, *the city of triumph*, is a ruined city within the presidency of Madras, being in lat. 15° 19′ n., and long. 76° 32′ e. It stands about 40 m. to the n.w. of Bellary, in a plain encumbered with granite rocks, many of which have been rudely sculptured into a variety of forms. After having been for two centuries the metropolis of a powerful Hindu kingdom, B. was sacked and ruined by the Mohammedans of the Deccan in 1564. Even now it presents traces of its grandeur, being 8 m. in circuit, and containing many edifices, both temples and palaces, of granite.

BIJAPORE', a t. of India, in Guzerat, in the Guicowar's territory, on the route from Mhow to Deesa, 200 m. n.w. from Mhow, and 60 m. s.e. from Deesa. Pop. 12,000.

BIJAPORE', BIJAPUR, or BIJAIPUR (*ante*), the ancient capital of an independent sovereignty in India, of the same name, once an extensive and opulent city, but now with mere vestiges of its old grandeur. It is on a fertile plain, 16° 50′ n., 75° 48′ e., and is still a town of great extent. The citadel, a mile in circuit and very strong, was built in 1849, and its defenses, 6 m. in circumference, were completed in 1566. Outside of the fort are the remains of a large city. The natives say that according to ancient records, B. once contained 1600 mosques and 1,000,000 houses. The outer wall of the city was of stone, about 20 ft. high and prodigiously thick, with ditch and rampart, and towers of stone at intervals of 100 yards. The great mosque, in the fort, was 200 ft. long by 165 wide, with wings 219 by 45 feet. The mosque and mausoleum of king Ibrahim Adil Shah, completed about 1620, was 36 years in building, and is reported to have cost $8,500,000. It is 115 by 76 ft., covered by an immense dome raised on arches. Among the curiosities of B. is the immense cannon, said to be the largest piece of cast brass ordnance in the world, captured from the king of Ahmadnagar by the king of B. in the 17th century. It is 14 ft. long, 28 in. caliber, and would carry a ball of 1600 pounds. The town is 245 m. s.e. of Bombay.

BIJAWUR, a petty native state in the Bundelcund agency, with an area of 920 sq.m., and a pop. of 102,000.

BIJBAHAR', one of the best-known towns in Cashmere, though not one of the most populous. It is situated on the banks of the Jhelum, about 25 m. to the s.e. of the metropolis, being in lat. 33° 47′ n., and 75° 13′ e. The only particular worthy of notice is a wooden bridge across the Jhelum, which, notwithstanding its simplicity, has endured for centuries, in consequence of the tranquil and equable weather of the valley. Pop. 2262.

BIJNOUR', a t. of India, the chief t. of the British district of the same name, n.w. provinces, in 29° 22′ n. lat., and 78° 11′ e. longitude. It is on the route from Mora-

dabad to Mozuffurnuggur, 31 m. e. from Mozuffurnuggur. Pop. '71, 12,566.—The district of Bijnour has an area of 1884 sq.m., and a pop. (1871) of 737,152.

BIKANIR', or BEEKANEER, a t. of India, the capital of a Rajpoot state of the same name, in n. lat. 28°, e. long. 73° 22'. It is situated in a singularly desolate tract, hard, stony, and utterly unfit for cultivation. The town is surrounded with a battlemented wall, and has a very imposing appearance. The pop. is estimated at 60,000.—The state of Bikanir extends from n. to s. about 160 m., and from e. to w. about 200 miles. Its area is 24,000 sq. miles. The climate is remarkable for extreme changes of temperature, the temperature during the night being often very cold, whilst the day is very hot. Ice is often formed on ponds in winter during the night, whilst the summer heat during the day sometimes reaches 123° Fahrenheit. The majority of the population are by descent Jauts, a people inhabiting from a very remote period a great extent of country between the Himalaya and the Indian ocean. The rajah and dominant race are Rajpoots. Bramans are numerous, but if they do not eat, they trade in oxen. There are many Jains. The burning of widows was in former times extremely prevalent in Bikanir. One corpse is said to have been burned with 84 victims. The annual revenue of the state is about £65,000. The military force amounts to about 5000. The pop. is about 300,000.

BIKH. See ACONITE.

BI'LANDER, or BI'LANDRE, is a small two-masted merchant vessel, distinguished from others chiefly by a peculiar shape and arrangement of the main-sail. Of these vessels, which were probably French in origin, there are not many now remaining.

BILBA'O, a seaport t. of Spain, capital of the province of Vizcaya (Biscay), is situated in a mountain gorge on the Nervion, about 6 m. from its mouth at Portugalete, in lat. 43° 14' n., long. 2° 56' west. B. is well built; the principal streets are straight, and the houses substantial. Four bridges, one of iron, opened in 1868, and a stone bridge of the 14th c., cross the river, which divides the old town from the new. There are several fine public walks, numerous fountains, but no public buildings of any note. The city is purely commercial. It has many extensive rope-walks and manufactures of hardware, leather, hats, tobacco, and earthenware. There are also docks for building merchant-vessels, and in the vicinity are iron and copper mines. Pop. 19,000. In 1864, a railway was opened to Tudela. Small vessels can navigate the river quite up to the town, but large vessels have to anchor at Portugalete. The total tonnage of the ships that entered B. in 1870 was 160,952. The imports consist chiefly of cotton and woolen manufactures, colonial produce, fish, jute, spirits, hardwares, machinery, railway materials, etc.; and the exports consist of wool, iron, fruits, oil, flour and grains, wines, madder, minerals, liquorice, etc. There are more than 200 commercial houses in Bilbao. The women here do almost all of the heavy porterage. B. was founded in the year 1300 by Diego Lopez de Haro, under the name of Belvao, i.e., "the fine fort," and being well situated, and little disturbed by the civil wars of Spain, it soon attained great prosperity. In the 15th c., it was the seat of the most authoritative commercial tribunal in Spain. It suffered severely in the wars with France, first in 1795, and again in 1808, when 1200 of its inhabitants were slaughtered in cold blood. During the Carlist struggles, B. was often besieged, last in 1874.

BILBERRY. See WHORTLEBERRY.

BIL'BILIS, an old Iberian city of Spain, about 2 m. e. from the modern town of Calatayud, in the province of Saragossa, chiefly celebrated as the birthplace of the poet Martial, but also famed for its highly tempered steel blades. Quintus Metellus won a victory over Sertorius here; and B., under the Romans, was a municipal town with the surname of Augusta. Several of its coins, struck off during the reigns of Augustus, Tiberius, and Caligula, are still in existence—some in the British musuem.

BIL'BOES are long bars or bolts of iron, with shackles sliding on them, and a lock at one end. When an offender on shipboard is put "in irons," it implies that B. are fastened to him, more or less ponderous according to the degree of his offense. The B. clasp the ankles in some such way as handcuffs clasp the wrist.

BIL'COCK. See RAIL.

BILDERDIJK, WILLEM, a Dutch poet and philologist, of much repute in his day, was b. at Amsterdam, 7th Sept., 1756. While studying law at Leyden, and afterwards, when practicing at the Hague, he devoted himself assiduously to literature and poetry. On the invasion of Holland by the French, he repaired to Brunswick, and afterwards visited London, where he supported himself by lecturing and teaching. In the year 1806, he returned to Holland, where he was received as one who had done his country honor; and the newly elected king of Holland (Louis Bonaparte) appointed him president of the institute at Amsterdam, just then organized after the fashion of the one at Paris, and also made him his own instructor in the Dutch language. B. afterwards resided at Leyden, and then at Haarlem, where he died, 18th Dec., 1831. His contributions to poetic literature were very numerous; but though they contain many beauties, yet, with one or two exceptions, none of his poems display any remarkable originality, or any great wealth of imagination. With his poetical pursuits he combined the theoretical

study of his native language; and his writings on this subject are valuable contributions to the exposition of the older monuments of Dutch literature.

BILE is a fluid secreted from the blood by the liver. One part of it is destined to serve in the process of digestion; the other to be eliminated from the system. It is colored yellow in man; that of graminivorous animals seems colored by the leaves they feed upon. The primary cells of the liver (the hepatic cells) separate the B. from the blood of the portal vein, and discharge it into small ducts, which unite to form larger ones, and eventually the right and left hepatic ducts. The latter unite to form the common hepatic duct, which is soon joined by that of the gall-bladder (the cystic duct). This junction forms the common B. duct, which pierces the second part of the duodenum, and running obliquely in its wall for a short distance, opens on its mucous surface.

The secretion of B. is constantly going on, and if there is food in the intestine, the bile mingles with it, and dissolves the fatty portions, preparatory to their absorption, the excrementitious portion of the B. passing out of the body with the other indigestible materials. When the bowel is empty, the B. ascends the cystic duct, and is stored for future use in a small flask-like bag (the gall-bladder) situated under the liver.

Should, from any cause, the elements of the B. be in excess in the blood, or should the liver suspend the function of secreting it, not only is digestion imperfectly performed, but the general health suffers from the impure condition of the blood, and the patient is said to be *bilious*. On the other hand, the B. may be secreted, but its escape interfered with, and then its reabsorption will produce jaundice (q.v.) Its solid portions, again, especially the cholesterine, may be in excess, solidify, and produce biliary calculi or gall-stones. See CALCULUS.

In *chemical composition*, B. is essentially a soap analogous to resin-soap, and as obtained from the ox, contains in 100 parts,

Water	90.44
Biliary and fatty bodies, including resinoid acids	8.00
Mucus	0.30
Watery extract, chlorides, phosphates, and lactates	0.85
Soda	0.41

The soap is formed from the union of the resinoid acids (*glycocholic* and *taurocholic acids*) with the soda. Human B. has the specific gravity of about 1026 (water = 1000), is of a ropy consistence, with a yellowish-green color; does not readily mix with water, but sinks therein, and only after repeated agitation becomes diffused through the water, which then assumes a frothy appearance resembling soap-suds. B. has a bitter taste, and a very sickening musky odor. It is interesting to observe that the B. of salt-water fishes contains potash in place of soda; although from their being surrounded by much common salt (chloride of sodium) in the sea-water, we should naturally expect to find soda in abundance; and the B. of land and fresh-water animals contains soda, while, considering diet and habitat, potash might more naturally be looked for in largest quantity. B. performs several important functions in the animal economy, which will be found treated of under the article DIGESTION; see also the articles LIVER and JAUNDICE.

BILED-UL-JERID. See BELED-EL-JEREED.

BILFINGER, or BÜLFFINGER, GEORG BERNHARD, 1693–1750; son of a Lutheran minister of Würtemberg, and, like several others of his family, born with twelve fingers and twelve toes. B. studied philosophy and theology in Tübingen, where he became preacher to the castle. He gained the prize (1000 crowns) offered by the academy of science of Paris for a solution of the problem of the cause of gravity. Later in life he was a privy councilor in Würtemberg, and greatly advanced the interests of public instruction and agriculture.

BILGE, sometimes called BULGE, is the part of the bottom of a ship nearest to the keel, and always more nearly horizontal than vertical. A ship usually rests on the keel and one B. when aground. The name of *bilge-water* is given to any rain or sea water which trickles down to the B. or lowest part of a ship, and which, being difficult of access, becomes dirty and offensive.

BILGEWAYS are timbers which assist in the launching of a ship; for which, see LAUNCH.

BILIARY CALCULI See CALCULUS.

BILIMBI. See CARAMBOLA.

BILIN, a t. of Bohemia, beautifully situated in the valley of the Bila, 17 m. w. of Leitmeritz, and famous for its mineral springs, the waters of which it exports to the extent of 500,000 jars annually. It has a manufactory of cotton yarn, and two castles, an old and a new one. In its vicinity there is a remarkable isolated clinkstone rock, called Borzenberg, or Biliner Stein; and the Tripoli earth found at B. has been shown by prof. Ehrenberg to be the remains of infusoria. Pop. about 4000.

BILIOUS FEVER. See LIVER.

BILL, in natural history, the hard, horny mouth of birds (q.v.). It consists of two *mandibles,* an upper and a lower, into which the upper and lower jaws are respectively produced, all appearance of lips being lost. It is not furnished with proper teeth, although rudiments of them have been observed in some of the parrot tribe in the fetal state, and the marginal laminæ with which the bills of many water-fowl are furnished, partake of the same character, being secreted by distinct pulps. The resemblance of these marginal laminæ to teeth is particularly marked in the goosander (q.v.). The bills of birds differ much, according to their different habits, and particularly according to the kind of food on which they are destined to live, and the manner in which they are to seek it. In birds of prey, the B. is strong; the upper mandible arched or hooked, and very sharp; the edges sharp, often notched, and the whole B., or *beak,* adapted for seizing animals, and tearing and cutting to pieces their flesh. A powerful, short, hooked beak, sharp-edged and notched, indicates the greatest courage and adaptation to prey on living animals. The beak of the vulture is longer and weaker than that of the eagle or falcon. In birds which feed on insects and vegetable substances, the hooked form of the B. is not found, or it is in a very inferior degree; those birds which catch insects on the wing, such as the goat-suckers, are remarkable for the deep division of the B., and their consequently wide gape, and an analogous provision to facilitate the taking of prey is to be observed in herons, kingfishers, and other fishing-birds; but the object is attained in their case by the elongation of the B., whereas birds which catch insects on the wing have the B. very short. Birds which feed chiefly on seeds have the B. short and strong, for bruising them; whilst the B. of insectivorous birds is comparatively slender. Many aquatic birds have broad and comparatively soft and sensitive bills, with laminæ on the inner margin for straining the mud from which much of their food is to be extracted; other birds, as snipes, avocets, etc., seeking their food also in mud, have slender bills of remarkable sensibility. The modifications of form are very numerous, and the peculiarities of the bills of toucans, hornbills, spoonbills, crossbills, parrots, humming-birds, etc., are very interesting, and intimately connected with the habits of the different creatures. (See these articles.) At the base of the upper mandible, a portion of the B. is covered with a membrane, called the *cere* (Lat. *cera,* wax, from the waxy appearance which it presents in some falcons, etc.), which in many birds is naked, in others is feathered, and in many is covered with hairs or bristles. The nostrils are situated in the upper mandible, usually in the cere, but in some birds they are comparatively far forward, and in some, as puffins, they are very small and placed so near the edge of the mandible, as not to be easily detected. They are more or less open, or covered with membrane, or protected by hairs or feathers. Besides their principal use for seizing and dividing or triturating food, the bills of birds are employed in a variety of functions, as dressing or preening the feathers, constructing nests, etc. They are also the principal instruments used by birds in their combats.

The mouths of some fishes and reptiles assume a character somewhat analogous to that of the B. of birds.

BILL, in its general acceptation, means a formal written paper or statement of any kind; originally, it was applied to any sealed document, being derived from Lat. *bulla,* a seal. It has a number of technical applications, for which see the articles that immediately follow.

BILL, or BROWNBILL, the main offensive weapon of English infantry until the substitution of fire-arms; a two-edged, sickle-shaped knife or sword, weighing from 9 to 12 lbs., on a handle 3 or 4 ft. long, and wielded with both hands. It had terrible power, sometimes taking off a person's head or cutting a man in two in spite of the strongest armor. It was also called a "glaive."

BILL, in legislation, the common name for a proposed but not consummated legislative act. In congress and in state legislatures laws usually first appear in the form of bills; they are read once or twice, and referred to the committee having charge of the subject to which they relate; e.g., a bill to amend the tariff would go to the committee on commerce. If the committee report unfavorably, the bill is ordinarily dropped or withdrawn; but if they report without objection, or favorably, it is referred to the committee of the whole for discussion, and reported from that committee to the house. After it has passed both houses, it goes to the committee on engrossed bills, who see that a correct copy is made for the signature of the president or governor, and if signed (or not returned within a time fixed by law, usually 10 days), the "bill" becomes a "law." If returned without approval, two thirds of all the members elected to each house (the houses voting separately) can enact it over the president's or governor's objections. Bills for raising revenue (in congress) must originate in the lower house, but the senate may propose and make amendments.

BILLARDIE'RA, or AP'PLEBERRY, a genus of twining Australian shrubs of the natural order *pittosporaceæ* (q.v.). They have simple alternate evergreen leaves, and axillary pendulous flowers. The flowers have a calyx of five sepals, and a bell-shaped sorolla of five petals. The fruit is a soft, spongy pericarp, with inflated cells, and many seeds which lie loose in the cells, terminated by the style, and generally bluish when ripe. It is eatable, although not destitute of a resinous character, which prevails in the

order. *B. longiflora* and *B. ovalis*, the former with nearly globose, the latter with oval fruit, are frequent ornaments of British greenhouses. The fruit of *B. mutabilis* is larger, cylindrical, and of a pleasant subacid taste.

BILLAUD-VARENNE, JEAN NICOLAS, a leader in the reign of terror in the French revolution; took an active part in the September massacres; entered the convention, where he distinguished himself for his violence against the king and the royal family, and his general unfeeling cruelty. He was the author of the revolutionary tribunal, and it was on his proposal that the duke of Orleans, the queen, and a host of others became its victims. He joined in the end in bringing about the fall of Robespierre, but could not ward off his own accusation as one of the terrorists, and was transported to Cayenne, where he lived about 20 years, rejecting the pardon offered by the first consul. In 1816, he came to New York, but was coldly received, and then sought an asylum in Hayti, where he died, 1819.

BILL-BROKERS are persons who, being skilled in the money-market, the state of mercantile and personal credit, and the rates of exchange, engage, either for their own profitable adventure, or that of their employers, in the purchase and sale of foreign and inland bills of exchange, and promissory-notes. They are to be distinguished from discount-brokers, or bill-discounters, whose business consists in discounting bills of exchange and notes which have some time to run before they come due, by means of the funds, or on the faith of the credit of capitalists or other persons having the command of money. See BROKER, BILL OF EXCHANGE, PROMISSORY-NOTE.

BILL-CHAMBER is a particular department of the court of session in Scotland (coeval with the establishment of that court itself in 1532), the business of which corresponds, in many respects, to the practice of the judges' chambers in England. It is called the B., because, formerly in Scotland, judicial proceedings were for the most part commenced by a writ called a bill, which was the skeleton or draft of the legal process which it was sought to have issued, and which bill was obtained in this particular department of the court. For such purpose, as well as for other matters which do not admit of delay, the B. accordingly sat, as it continues to sit, all the year round, and as in England, it is presided over by a single judge. This judge, to whom for the time are delegated the whole powers of the court, is called the lord ordinary on the bills, and during the sittings of the court of session, the duty is taken by the junior or last appointed judge of the court; but in vacation time, the business of the B. is performed in rotation by the six judges of the court who are not justiciary or criminal judges. In case of the indisposition or absence of any of these six judges, any judge of the court of session may act for him. A recent act, the 20 and 21 Vict. c. 18, now regulates many of the details of the procedure.

The business of the B. consists of all matters of a summary nature; and generally all cases requiring the immediate interposition of judicial authority are proceeded with, in the first instance, in the bill-chamber. Applications for interdict or injunction, and for warrants necessary for the execution of process, are there at once made. The preliminary procedure by way of appeal from inferior courts, and in order to stay execution on the judgments of these tribunals, also takes place, in the first instance, in the bill-chamber. Matters of bankruptcy or sequestration are also adjudicated on in this department. But the decision of the judge or lord ordinary officiating in the B., may, with some exceptions, be brought under review of the court; and the judgment of the court itself thus sitting on B. cases, may be brought before the house of lords by appeal, as in ordinary cases. See COURT OF SESSION, JUDGE'S CHAMBERS.

BILLET, in architecture, an ornament belonging to the Norman style. It was formed by cutting a molding—generally a round molding—into notches, so that the parts left resembled billets of wood. When used in several rows, the billets and empty spaces are placed interchangeably.

BILLET, in heraldry. Billets are small oblong figures, sometimes taken to represent bricks, but more commonly *billets doux*. The latter interpretation, which is that of Guillim, is generally adopted by English heralds, and is supported by the authority of Colombiere. The former again, which has the *Trésor Héraldique* and sir George Mackenzie on its side, is further strengthened by the fact that in German they are called *Schindeln*, shingles.

BILLETING is a mode of provisioning and lodging soldiers when not in camp or barrack. It is one of the many vexed questions connected with the organization and administration of the British army. When in camp or barrack, the soldier is supplied with hot food daily by the commissariat officers; or rather, with undressed food, and the means for cooking it. But when it is necessary to keep soldiers for one or more days in a town unprovided with barracks, a difficulty occurs which has never yet been properly surmounted; a burden is sure to rest on some one who is unwilling to bear it. In the early times of our history, monarchs were often wont to quarter their troops on the monasteries. In later times, the soldiers often compelled the inhabitants of towns to receive and support them; and the authorities were either unable or unwilling to prevent this. The mutiny act, passed for the first time in 1689, put a stop to this pernicious practice, by declaring that no housekeepers should be compelled to accommo-

date soldiers except on some recognized and fairly administered system. The chief civil magistrate of a town, on requisition from the military authorities, quartered the soldiers on the inhabitants as fairly as he could. This continued in England until 1745, when all kinds of persons were exempted from this burden except certain traders; and the new system has been maintained with minor alterations ever since. The alteration was not made in Scotland until 1857.

At present, the persons liable to have soldiers billeted on them, are the keepers of public-houses, hotels, inns, ale-houses, beer-shops, wine-shops, spirit-vaults, livery-stables, and such like licensed houses. There are certain exceptional cases provided for; and in and near London there are special regulations concerning the B. of the guards; but the general rule is as here stated. The persons liable are bound to accommodate soldiers, under a system that may be described in a few words. When troops are on the march from one barrack or station to another, and cannot cover the distance in one day's railway or foot traveling; or when they are to remain for a few days in a town unprovided with barrack accommodation, or where the barracks are already occupied—the commanding officer sends previously to the chief civil magistrate, and demands *billets* for a certain number of men for a certain time. The magistrate has a list of all the houses subjected to the B. system, and he quarters the men on those houses as fairly as he can. Rules are laid down to prevent the magistrate from B. too many soldiers on one house: any excess in this way is remediable at the hands of a justice of the peace. The billets are pieces of paper prepared under these rules. On the evening before the arrival of the troops, two or three non-commissioned officers enter the town, and present an order for the delivery of the billets to them, in order that no delay may arise when the main body enter. After the arrival, the soldiers go to the houses on which they are billeted: all those belonging to one company being quartered as near together as may be, for convenience of muster; and the sick are billeted near head-quarters. The licensed victualer, or other person, is bound to provide each billet-holder with food, drink, bed, and accommodation, either in his own house or somewhere near at hand. A specified sum of 10*d.* per day is allowed for this; or, under other circumstances, a trifling sum per day is allowed for fire, candles, cooking-utensils, salt, and vinegar. The sum per day allowed for hay and straw for a horse varies with the price of forage. The officers visit the houses, to see that the men really have one hot meal per day, instead of taking the value of it in money. The soldier may demand facilities for cleaning his arms and accouterments. The financial officer of the regiment makes the payments. There are often unpleasant disputes between the innkeeper or others, on the one side, and the officers of the regiment on the other, concerning the occupancy of the "best room," and on minor details. The militia are frequently billeted like the regulars.

There being many untoward circumstances connected with this system, a committee of the house of commons, in 1858, sought how best to remove them. In their report, the committee could not recommend the cessation of the B. system altogether, but they pointed out certain possible ameliorations; and since that, by camping out the troops and other means, great efforts have been made to reduce B. to a minimum.

BILL, EXCHEQUER. See EXCHEQUER BILLS, *ante*.

BILLIARDS (in Fr. *billard*, which meant originally the stick or staff with which the ball is struck, and is allied to Fr. *billot*, a block or billet of wood). It seems doubtful whether we are indebted for the discovery of this elegant game to France or Italy; but it is certain that it was imported hither from the former country. It must have been known, at all events by name, to Englishmen as early as the 16th c., since Shakespeare speaks of it; although when he represents Cleopatra as amusing herself with B. in Egypt, it is probable that he commits an anachronism. It is certain that the rectangular slate-table, with its resilient sides, covered with green cloth, and furnished with the six brass-bound pockets, the three ivory balls, and that long array of cues with leathern tops, so familiar nowadays to almost every eye, are paraphernalia of quite modern production. For two centuries, B. was played with only two balls; and when the third or red ball was imported from France, the red winning hazard—that is to say, the holing of the red ball—was almost the sole object of the performers. The cushions also, now universally constructed of india-rubber, up to a recent date were lined with felt. In no game are knowledge and manual dexterity so combined as in B., nor can the spectacle of first-rate play be appreciated, or the difficulties which it overcomes be understood, except by those who have a scientific as well as practical acquaintance with the game.

A billiard-table varies in size, but it is generally about 12 ft. long and 6 ft. wide. It is covered with fine green cloth, and set round with cushions, to keep the balls upon the table and make them rebound. The six holes or pockets are placed at the four corners and in the middle, opposite to each other, to hold the balls, which, when played into them, are called "hazards." The cues are long smooth sticks, with one end thick, and the other pointed; and the small end is covered with leather. The maces—slender sticks with a club at one end, adapted for pushing—are rarely taken in hand except by tyros and ladies, the butt-end of the cue, when the point cannot conveniently be used, being commonly employed instead. The three balls are of ivory, ranging from 1 in. to 1¼ in. in diameter, and two of them are white, and one is red. One of the former has a spot upon it; and when two persons are playing, he who uses the spot ball is called

spot, and he who uses the plain ball, plain. The cue is held in the right hand, and supported, in playing, by the forefinger and thumb of the left so placed as to form a "bridge;" and the ball is struck with the point of the cue, which is chalked, to prevent its slipping. On a certain mark on the cloth, at the distance of about a foot from one end of the table, and exactly in its center, the red ball is placed before commencing the game. At the other or lower end, and at the distance of about 2 ft. from it, a line is drawn across the table; and from the center of this line a semicircle is described between it and the lower end, of about 20 in. diameter. The space within this semicircle is called *baulk*. The object of the player is, by striking his own ball against the red ball or his adversary's, to drive either it or them into the pockets; or else to make a "cannon"—that is to say, to strike both balls with his own. The score is usually recorded by a third person, by means of a marking-board. The game of B. can be played by two, three, or four persons, and in a great many different fashions; but it is most commonly played by two, and the ordinary game is that called the *cannon*, or more properly *carambole*, introduced from France at the same time with the third or red ball. The technical term "cannoning" may perhaps have arisen from "caramboling," which was the old word for striking both balls with your own. The method of play is as follows:

1. The limit of the game is properly 21, though it is sometimes made 24, 50, 63, 100, or more, as may be agreed upon before commencing. The shorter games were probably used when billiard-tables were rarer, so that persons waiting for the use of them might sooner have their turn; 50, or "50 up," as it is called, is now the most usual limit.

2. For the lead and choice of balls, the players *string*—that is to say, placing their balls within the semicircle, they strike them against the furthermost cushion, in order to see which will return nearest the cushion next to them: the owner of the ball so placed, provided it does not strike the other ball, has then the option; but after the first match, the winner of each game leads.

3. The red ball on the spot at the upper end is replaced there on being put into a pocket, knocked off the table, or when the balls are "broken" (see 19) after a foul stroke; but should any ball be on the spot, or so near to it as to prevent the red being placed there without touching the ball, the red must be placed in the center of the table.

4. The points of the game are these: 1 for a miss, 2 for a cannon, 2 for a white hazard, 3 for a red hazard, and 3 for "running a coo;" but the miss and the coo count for the adversary.

5. A white winning hazard is made when you play at the white ball and pocket it; a white losing hazard, when you pocket your own ball off the white. These names of "winning" and "losing," were used in the old game of B. with two balls, but their meaning is now reversed, it now being commonly a *dis*advantage to make a winning hazard; and *vice versâ*.

6. A red winning hazard is when you pocket the red; a red losing hazard, when you pocket your own ball off the red.

7. A cannon is when your ball strikes the other two.

8. A miss is when your ball strikes no other.

9. A coo is when your ball goes into a pocket, or jumps off the table without striking another.

10. A four-stroke is made by playing at the white, making a cannon, and pocketing your own or adversary's ball; or by pocketing his and your own without the cannon, or by playing at the red, making a cannon, and pocketing your opponent's ball.

11. A five-stroke is made by playing at the red, making a cannon, and pocketing your own or the red; or by pocketing the red and your adversary's ball without the cannon; or by pocketing your own and adversary's ball off the red; or by playing at the white, making a cannon, and pocketing the red; or by playing at the white, and pocketing your own and the red.

12. A six-stroke is made by playing at the red, and pocketing it and your own; or by striking the white first, making a cannon, and pocketing your own and adversary's ball.

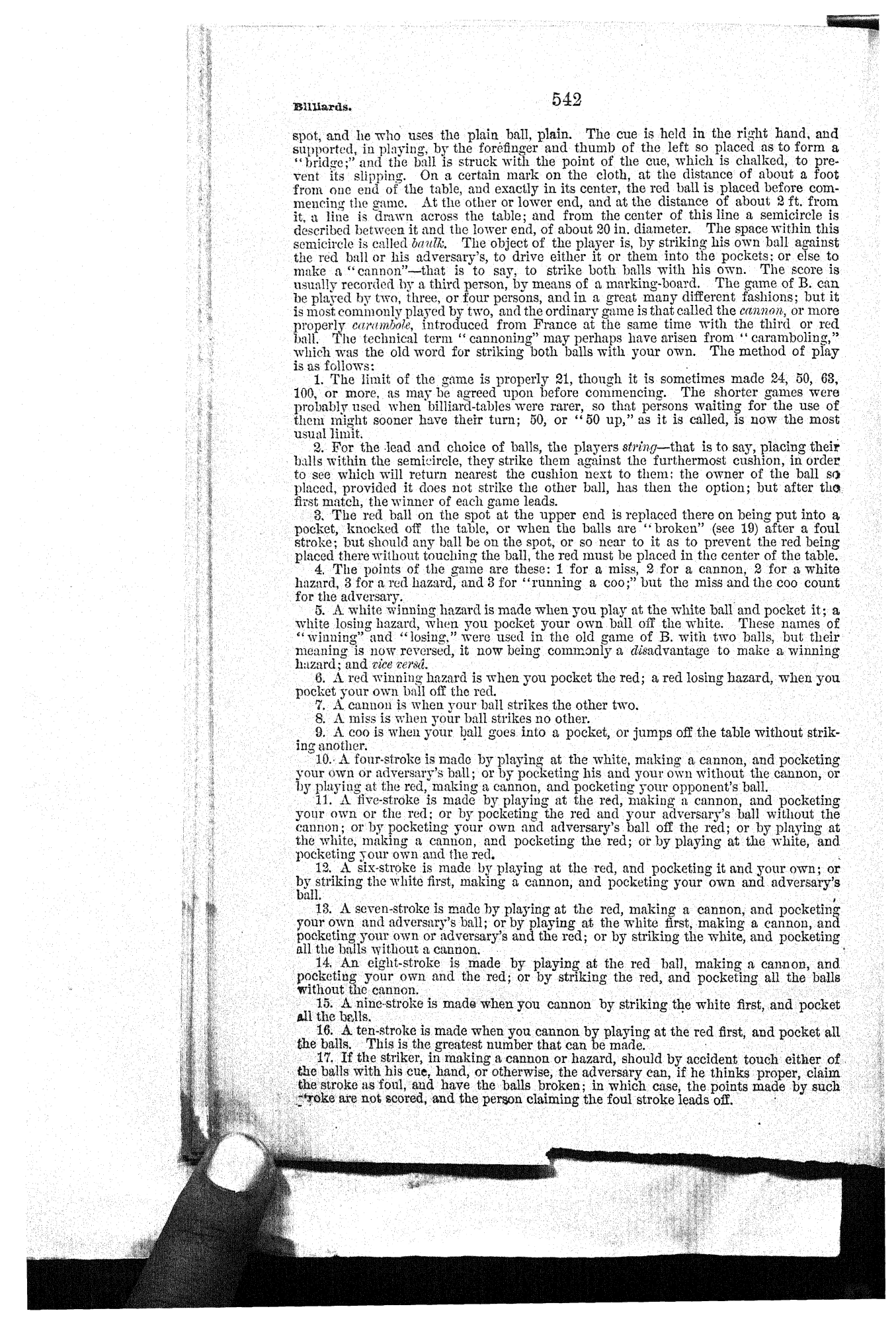
13. A seven-stroke is made by playing at the red, making a cannon, and pocketing your own and adversary's ball; or by playing at the white first, making a cannon, and pocketing your own or adversary's and the red; or by striking the white, and pocketing all the balls without a cannon.

14. An eight-stroke is made by playing at the red ball, making a cannon, and pocketing your own and the red; or by striking the red, and pocketing all the balls without the cannon.

15. A nine-stroke is made when you cannon by striking the white first, and pocket all the balls.

16. A ten-stroke is made when you cannon by playing at the red first, and pocket all the balls. This is the greatest number that can be made.

17. If the striker, in making a cannon or hazard, should by accident touch either of the balls with his cue, hand, or otherwise, the adversary can, if he thinks proper, claim the stroke as foul, and have the balls broken; in which case, the points made by such stroke are not scored, and the person claiming the foul stroke leads off.



18. Foul strokes are made as follows—namely, by the striker's ball touching either of the others; by touching any ball while rolling; by moving another ball in any way while taking aim or in the act of striking; by pushing the balls together when playing with the *butt* of the cue; by playing with both feet off the floor; by playing at a ball before it has done rolling; or by playing with the wrong ball: in this last case, should a hazard or cannon be made the adversary can have the balls broken and lead off; or should no score be made by such stroke, he can take his choice of balls and play.

19. In "breaking" the balls, you take them all off the table, place the red on the spot, and both parties play from the baulk as at commencing.

20. If the balls have been changed, and it cannot be ascertained by whom, the game must be played out with them as they then are; or even if two strokes have been made before the mistake is discovered, it must still be played out in the same way.

21. Should the striker, in making a cannon or hazard, knock his own or either of the balls off the table, he cannot score the points made by such stroke, and the opponent plays, but the balls are not broken.

22. If a ball stops on the edge of a pocket, and afterwards falls in, either through the shaking of the room, or table, or by any other accident, it must be replaced as near the original place as possible.

23. Should the striker, when in hand (i.e., when his ball is off the table), play at a ball in baulk, his adversary has the option of scoring a miss, or of having the balls replaced, and the stroke played again, or of breaking the balls.

24. If the striker's ball touch another, he must play, and should he make a cannon or hazard, the adversary can claim it as foul, or he can allow points to be scored and the person to play on; but should the striker not score, it is at the option of the opponent to break them or not.

25. Should the marker, whilst marking for the players, by accident touch either of the balls, while rolling or not, it must be put as near as possible to the place it would have otherwise occupied.

26. If the last player should alter the direction of the balls while rolling, with cue, hand, or otherwise, the striker may place it where he thinks proper.

27. A line-ball is when either the white or red is exactly on the line of the baulk, in which case it cannot be played at by a person whose ball is in hand, it being considered in baulk.

28. If the striker's ball is over the pocket, and he should, in the act of striking, miss it, but in drawing his cue back knock it into the pocket, he will lose three points, it being a coo.

29. If the red ball has been put into a pocket, it must not be placed on the spot till the other balls have done rolling, should there be a probability of either of them touching it again, as the stroke is not finished till the balls stop.

30. If the striker should touch his ball by accident when taking aim, it is not a stroke, and the ball is to be replaced; but should he touch it in the act of striking, then it is a stroke.

31. If either of the balls lodge on a cushion, it is off the table, and should a cannon or hazard be made, it does not score, and the ball must be placed on the spot, or played from the baulk, according to whether it is white or red.

32. Any person refusing to play the game out after he has played one stroke, loses it.

33. In a match of four, each person is at liberty to offer his partner advice.

34. All disputes in the game to be decided by the marker or majority of the company, but no person has a right to interfere until appealed to by one or both players.

35. It is called a love-game when no hazard has been made by the loser.

With first-class players such as Cook, Roberts, and others, the "spot stroke" is a favorite and telling one. It consists of holding the red ball (from its spot at the upper end of the table), stroke after stroke consecutively, in either of the bottom pockets. So great is the skill now displayed in this stroke, that breaks of 150 and more are frequently made. With its aid the proficient will occasionally score several hundred points before letting his adversary "in." Scores of about 700 or 800 have been achieved.

The only other game played upon a billiard-table which it seems necessary for us to notice, is that called pool. It is quite different from that above described, nor is it necessary that a good player at the one should greatly distinguish himself at the other. Pool is the game pursued at all the public billiard-rooms, and is the sole profession of many persons who might otherwise employ themselves to more advantage, if not to greater profit, since the requisites for forming a first-rate player are really high—namely, steadiness of hand and eye, imperturbable temper, and exact dynamical calculation. Pool is played by any number of persons—when between two only, it is called "single pool," and is nothing else than the old game at B. before the introduction of the red ball—and after various methods, such as playing at the last player, playing at the nearest ball, and playing at any ball whatever. The most common is that of playing at the last player, the rules of which game are to be found, by those whom they concern, upon the walls of every room where it is played. The best billiard-tables, furnished with slate bed and India-rubber cushions, cost from £70 to £80, and upwards.

BILL, or BILL OF COMPLAINT, **IN CHANCERY**, was a formal statement in writing or pleading, by which a plaintiff in the court of chancery asked its equitable redress or

relief. It was in the style of a petition addressed to the lord chancellor, lord keeper, or lords commissioners for the custody of the great seal, unless the seals were at the time in the queen's hands, or the chancellor himself were the suitor, in which case the bill addressed the queen herself; for, according to the theory of the court of chancery, it was the conscience of the sovereign that was there addressed. The crown itself, however, was also the suitor, either on behalf of its own prerogatives, or of those rights which are under its particular protection, such as the objects of a public charity; and then the matter of complaint was laid before the court, not by way of bill or petition, but of *information*. But since 1874 all suits begin by writ.

In stating the plaintiff's case, the bill was formerly exceedingly prolix and tedious, but now the statement of claim of plaintiff contains merely a full and distinct account of the case, the material facts and circumstances relied on; and it should ask specifically for the particular relief which the plaintiff conceives himself entitled to, and also for general relief, or, as the bill once usually stated, "for such further and other relief as the court may think proper;" the object and advantage of which general prayer was, to decree equity and justice without regard to the particular equity sought for. It is unnecessary that the claim be signed by counsel, in order to guard against irrelevant and improper matter. It is indeed in nearly all cases drawn by counsel, from instructions laid before him by the plaintiff's solicitor.

Where the object is the administration of the estate of a deceased person, the procedure is by *summons*, and is of a simple and very summary nature. In cases of this description, without either formal pleading or any direct application to the court itself, a summons may at once be obtained, and the estate thereupon put in a course of administration. There are also cases where the chancellor's aid is sought for in the form of a *petition*.

Generally speaking, the modern English claim in chancery very much resembles the Scotch summons and condescendence. See on the subjects of this article, CHANCERY; CHANCELLOR, LORD; PLEADING; SUMMONS; CONDESCENDENCE.

BILL IN CRIMINAL CASES is the formal name of an indictment for a crime or misdemeanor, when preferred before a grand jury. If that body finds "a true bill," the prisoner or party accused is thereupon tried before a petty jury, whose verdict determines his guilt or his innocence; but if the grand jury "ignore the bill," the accused is at once set at liberty. In the latter event, however, other bills may be sent up against him, with or without the same result. See ARRAIGNMENT, GRAND JURY, INDICTMENT, PROSECUTION, TRIAL.

BILLINGS, JOSEPH, an English navigator with capt. Cook in his last voyage. In 1785, he went into Russian service, and explored the region around Kolyma river in e. Siberia, near the winter quarters of Nordenskjold, in 1878–79. In 1789–90, he made several voyages in the Okhotsk sea and the Arctic ocean, exploring the islands near the coast of Alaska. He returned to Kamchatka in 1791.

BILLINGS, JOSH. See SHAW, HENRY W.

BILLINGS, WILLIAM, 1746–1800; an American composer who gave up the trade of a tanner to teach psalm-singing, and published six books of tunes, nearly all of which were of his own composition. So far as known, he was the first American composer of music, and his music, which now seems so quaint, was at one time universally popular.

BILLINGSGATE, a gate, wharf, and fish-market, a little below London bridge, to the w. of the custom-house. It was opened in 1558 as a landing-place for provisions; and in 1699 was made "a free and open market for all sorts of fish." It is the only wholesale fishmarket in London; and fish of every kind, fresh or cured, is admitted free of duty, if taken by British subjects and imported in British vessels. Lobsters and turbot, also, are admitted free, though in foreign vessels. All fish are sold by tale, except salmon and eels, which are sold by weight; and oysters and other small shell-fish, which are sold by measure. The influx of salmon about the beginning of autumn is sometimes about 1000 boxes per day. The market opens daily at 5 A.M.; no fish is sold on Sunday, except mackerel. The fishermen consign their cargoes to the dealers, or "salesmen," who occupy stalls in the market; and these supply the retail-dealers. An officer called the clerk has the general superintendence of the market, and the quality of all fish offered for sale is tested by inspectors. The unpolished phraseology native, though not peculiar, to this quarter of London, has given rise to the proverbial use of the name.

BILLINGTON, ELIZABETH, the most celebrated English female singer of her day, was the daughter of a German musician named Weichsel, and b. in London, 1769. She early came forward as a performer on the piano and as a composer; and having married her music-master, Thomas B., appeared with brilliant success on the opera stage in Dublin in 1786. Returning to London, she was engaged at Covent Garden at the then unheard-of salary of £1000 for the season. She perfected her musical education under Sacchini in Paris, who wrote for her his opera, *Inez de Castro*, while she was singing in Naples, 1794. She appeared subsequently in Venice and Rome with the greatest applause. In 1799, her first husband being dead, not without suspicion of poison, she married a Frenchman of the name of Florissant, and returned to London, 1801, where she received £4000 for six months, playing alternately at Covent Garden

and Drury Lane. She retired from the stage in 1809, and died (1818) at her villa, near Venice. Her character as a wife was the reverse of exemplary; but as a singer she was unrivaled. To a voice of the largest compass and richest tone, trained in all the art of the Italian school, she added a fascinating personal beauty and grace. In illustration of her spirit, it is told that Catharine II. proposing, through her London ambassador, to engage Mrs. B. for the theater of St. Petersburg, the vocalist demanded a sum that seemed to the ambassador exorbitant. "The empress of all the Russias does not give more to her ministers." "Then let her make her ministers sing," was the reply.

BILL IN PARLIAMENT. See ACT OF PARLIAMENT and PARLIAMENT.

BILLITON, an island in the Dutch East Indies, between the s.e. of Banca and the s.w. of Borneo. It is separated from the former by Clement's strait, and from the latter by the Caremeta or B. passage. Its n.w. point is in lat. 3° 13′ s., and long. 108° 7′ east. It is said to contain 2500 sq.m. and 20,000 inhabitants. It is rich in iron and timber, and imports rice, trepang, edible birds-nests, seaweed, tortoise-shell, and wax. Its coasts are beset with rocks and islets.

BILL OF ADVENTURE is a writing by a merchant, stating that goods shipped by him, and in his name, are the property of another, whose *adventure* or chance the transaction is—the shipping merchant, on the other hand, undertaking to account to the adventurer for the produce. Generally, in commercial law, an adventure may be said to be a speculation in goods shipped under the care of a *supercargo*, to be disposed of by him to the best advantage, for the benefit of his employers.

BILL OF ATTAINDER, and BILL OF PAINS AND PENALTIES, are bills in parliament, introduced for penally enacting the attaint and punishment of persons who have criminally offended against the state and public peace. Such a legislative proceeding was had recourse to generally in times of turbulence, when, either from the peculiar nature of the offense, or in consequence of difficulties in the application of the ordinary laws, it became necessary to resort to parliament. During the reign of Henry VIII., persons of the highest rank were frequently brought to the scaffold by such means; among whom may be mentioned the earl of Surrey, the earl of Essex, and others, who suffered for denying the king's supremacy; and during other reigns, both before and after that of Henry VIII., these bills were more or less had recourse to. There were greater facilities for conviction by this penal legislation than by the ordinary judicial procedure at law; because, while in the latter the strict rules of legal evidence must have been observed, the inquiry under a bill of attainder, or of pains and penalties, was entirely in the hand of parliament, who might dispense at their pleasure with such rules and forms of law as appeared inconvenient or unsuitable to the purpose in hand. Accordingly, in most of the cases to which we have referred, the bills were passed upon evidence which could never have been received as sufficient or even admissible in a court of law; and there are even instances where parties were attainted, and punished, without there being any evidence against them at all, and even without their being heard in their defense. Under the Stuarts, the extraordinary mode of proceeding in parliament was seldom had recourse to in England, and it has been still seldomer used since the accession of the house of Hanover. The Jacobite movement in Scotland, after the union with that country, was productive of several instances of parliamentary attainder, which, however, resulted merely in the forfeiture of the estates of the attainted parties, and these attainders were likewise unattended with the harsh, and in too many instances, capital consequences, which were formerly the inevitable results of treason so discovered. In regard to bills of pains and penalties, perhaps the two most remarkable instances are those of bishop Atterbury, in 1722 (see ATTERBURY), and of queen Caroline, wife of George IV., in 1820.

The proceedings of parliament in passing bills of attainder, and of pains and penalties, do not vary from those adopted in regard to other bills. But the parties who are subjected to these proceedings are admitted to defend themselves by counsel and witnesses before both houses. In the best of times, this summary power of parliament to punish criminals by statute, should be regarded with jealousy; but whenever a fitting occasion arises for its exercise, it is undoubtedly the highest form of parliamentary judicature. In impeachments, the commons are but accusers and advocates; while the lords alone are judges of the crime. On the other hand, in passing bills of attainder, the commons commit themselves by no accusation, nor are their powers directed against the offender; but they are judges of equal jurisdiction, and with the same responsibilities as the lords; and the accused can only be condemned by the unanimous judgment of the crown, the lords, and the commons.—May's *Proceedings of Parliament*, 3d edition, p. 509. In passing bills of attainder, the bishops, contrary to the practice in capital impeachments, take part in the proceedings, and vote.

In such parliamentary attainders, the bill sets out, by way of preamble, the facts and evidence on which it is founded, and concludes, by way of enactment, that the accused "is hereby convicted and attainted of high treason, and shall suffer the pains of death, and incur all forfeitures as a person attainted of high treason." In the case of pains and penalties, again, the preamble generally assumes the facts as proved, and proceeds to enact the pains and penalties; that is, the deprivations, indignities, and other punishment awarded. See ATTAINDER, PAINS AND PENALTIES. BILL IN PARLIAMENT.

BILL OF ATTAINDER (*ante*). The constitution of the United States expressly declares (art. i., sec. 9) that "no bill of attainder or *ex-post-facto* law shall be passed."

BILL OF COMPLAINT IN CHANCERY (*ante*), is the same as a declaration in an action at law, a libel in admiralty courts, or (in England) an allegation in a spiritual court. It is a complaint in writing addressed to the chancellor, giving the names of the parties to the suit, a statement of the matters on which the complainant relies, the allegations which he makes, the assertions that the matters complained of are contrary to equity, and a prayer for relief. Ordinarily, such a bill consists of nine parts: 1, the address; 2, the names of the parties; 3, statements of the plaintiff's case; 4, a general charge of confederacy; 5, the allegations of the defendant's pretenses; 6, the clause of the jurisdiction; 7, a prayer that the defendant may answer; 8, a prayer for relief; 9, a prayer for process. In recent practice the "confederacy" and the reference to the defendant's probable answer, and also the jurisdiction clause, are omitted, except where confederacy and fraud are specifically charged.

BILL OF COSTS is an account stating articulately and in detail the charges and disbursements of an attorney or solicitor in the conduct of his client's business; and which costs may be recovered under the regulations of the attorneys' and solicitors' act, 6 and 7 Vict. c. 73. See COSTS.

BILL OF COSTS (*ante*), the statement of items that make up the full amount of costs in a suit. It is assessed by the proper court officer, and the tax may be demanded before the payment of the main bill.

BILL OF CREDIT, a paper issued and circulated as money by a government. Though the federal constitution denies to the states the power to issue such bills of credit, it is indirectly done in banking when the bills of a bank authorized by a state are issued as money.

BILL OF EXCEPTIONS is a statement of objections, by way of appeal, against the ruling or charge of a judge in a civil cause. See TRIAL.

BILL OF EXCEPTIONS (*ante*), a written statement of objection to a decision of a court on a point of law, made by either party in a case, and certified by the judge making the decision excepted to. The object of a bill of exceptions is to bring the points complained of before the proper court for review and possible reversal of the decision.

BILL OF EXCHANGE, a document purporting to be an instrument of pecuniary obligation for value received, and which is employed for the purpose of settling a debt in a manner convenient to the parties concerned. The original and simple idea of a bill is this: Two parties residing at a distance from each other can settle their transactions without the trouble or risk of sending money direct from the debtor to the creditor. Thus, A and B are two parties in business in London; and C and D are merchants in Cadiz. A owes C £1000; and D owes B a like sum. Instead of A sending cash to C, and D to B, A pays B and receives B's bill on D, which he sends to C, who receives the amount from D; so that the transaction throughout is settled, without a farthing in money being sent from Cadiz to London, or from London to Cadiz. Another simple idea of a bill is this: One person owes another £100 for goods, for which he is to have credit for three months. The creditor, however, not being able conveniently to be without the money for that length of time, gets from the debtor an obligation or bill bearing that the £100 is to be paid in three months. This bill, being a negotiable instrument, will be discounted by a banker, or other capitalist, who now stands in the position of the creditor, and receives payment when the bill is due. Thus, a bill of exchange performs two kinds of offices in commerce—it saves the transmission of coined money, and it enables creditors not only to fix down debtors to a day of payment, but to get the use of a sum equivalent to the debt (less a small discount) before it is properly due.

The origin of this important mercantile instrument is attributed by Montesquieu and others to the Jews and Lombards, when banished from France and England in the 13th c., for their usury and other alleged vices, in order the more easily to recover the effects they had left behind in these countries; but Blackstone shows its earlier use in the Mogul empire in China; and Depauw, in his *Philosophical Researches respecting the Greeks*, has attempted to prove that bills of exchange were in use among that people, and particularly among the Athenians. However this may be, it is certain that hitherto no trace of them has been discovered either in the Roman code, or in any other system of ancient jurisprudence. The first notice of them in modern times occurs about the middle of the 12th c., and by the end of the 14th they had got into general use in all the commercial states of Europe. In England, from about the middle of the 14th c. down to the time of James I., and for many years after, bills of exchange were restricted to the purposes of foreign commerce. What are called inland bills—that is, bills drawn by and upon persons resident in this country—were not employed much earlier than the reign of Charles II., and even then they were regarded with distrust and jealousy by the English judges. Another restriction upon bills of exchange was, that the privilege of their use was confined to parties that were merchants; and there is an old case tried by the court of king's bench, in the days of William and Mary, where it was decided that an action on a foreign bill of exchange could not be maintained, because the defendant was a *gentle-*

man, and not a merchant! But all restraints on such instruments gradually yielded to the wants and conveniences of society, and now any one capable of making a contract can be a party to a bill transaction, without regard to position, calling, or occupation. In Scotland, inland bills were put on the same footing with foreign bills, by an act of the Scottish parliament passed in 1696.

A bill of exchange, as distinguished from a *promissory-note* (q.v.), is defined in law-books to be a written and open letter of request, addressed by a person who is called the drawer, to another person called the drawee, desiring him to pay a certain sum of money, either to the drawer himself or to a third party called the payee, within a certain time after its date, or after it is presented for payment, or on demand. If the drawee signs the bill in token of his agreeing to this request, he is called the *acceptor*. For the constitution of the bill itself, no particular form of words is necessary, provided its characteristic qualities clearly appear on the face of it, as an essentially pecuniary instrument; a bill of exchange is only good for a certain sum in money: such an instrument for the delivery of *goods* or property other than money, would be invalid. But although no particular words are required in a bill or note, it is always advisable to adhere, as much as possible, to their customary form. To this general rule, however, there are exceptions: thus, by the 48 Geo. III. c. 88, negotiable bills or notes for less than 20*s*. are void; and by the 17 Geo. III. c. 30, s. 1—made perpetual by the 27 Geo. III. c. 16, and 7 Geo. IV. c. 6—such bills and notes under 20*s*. are illegal, and above this amount and less than £5, are also void unless they specify the name and place of abode of the person to whom or to whose order they are made payable, and are attested by one subscribed witness at the least, and bear date at or before the time when they are issued, and are made payable within 21 days after the date, and are in the form prescribed by the act. There are also certain forms prescribed with respect to checks, and with respect to bills and notes issued and reissuable by bankers at certain distances.

In regard to foreign bills, the risk of miscarriage to which they are liable in their transmission to distant countries has given rise to the custom of drawing them *in sets;* that is, writing out two or three of the same form and tenor, and transmitting them to the payee by different channels, so that if one or two of the individuals of any set are lost, the other might reach its destination. The first of the set that is presented and accepted is alone entitled to payment, and payment of it discharges the acceptor; but foreign bills of course, may also be drawn singly.

Besides the other requisites mentioned, bills of exchange must be duly *stamped*. The regulations on this subject are contained in the 17 and 18 Vict. c. 83, and are to be found in almanacs and other publications in common use. By sections 3 and 5 of the act, it is provided that the duties on bills drawn out of the United Kingdom shall be denoted by adhesive stamps, to be affixed by the holder of the bill before negotiating it, under penalty of £50.

The following are the usual forms of the bills of exchange:

FORM OF A FOREIGN BILL.

£1000. JAMAICA, 1*st Jan.*, 1878.

Fifty days after sight of this first of exchange (second and third unpaid) pay to the order of A. B. one thousand pounds sterling, value received.

To E. F., London. C. D.

FORM OF AN INLAND BILL.

£100. LONDON, 1*st Jan.*, 1878.

(Stamp.) Two months after date [or "at sight," or "on demand," or "at —— days after sight"], pay to Mr. ——, or order, one hundred pounds, for value received.

To MR. ——, merchant, Bristol, payable at ——. C. D.

FORM OF A BILL ABOVE ONE AND UNDER FIVE POUNDS.

As prescribed by stat. 17 Geo. III. c. 30. [Insert the place, day, month, and year, when and where made.]

Twenty-one days after date, pay to A. B. of ——, or his order, the sum of ——, value received.

To E. F. of ——. *Witness*, G. H. E. D.

From the first form it will be seen that there are usually three parties to a bill of exchange, these three being: 1st, The *drawer* (C. D.); 2d, The *payee*, or party in whose favor the bill is drawn, and who is entitled to receive the contents (A. B.); and 3d, The *acceptor* or *drawee* (E. F.). The transaction, however, may be simply between the drawer and acceptor, without the interposition of a third party; and there are other modifications and changes of form, according to the circumstances of the case, and the mode in which it is desired to have the bill negotiated. The bill being thus in proper form, and duly authenticated, is then presented for acceptance, which may be defined to be the act by which the drawee evinces his consent to comply with, and be bound by, the request contained in the bill of exchange directed to him; or, in other words, it is an engagement to pay in money the bill when due. While the bill is in the possession of A. B. he is the holder, but if he pass it to G. H., A. B. is the indorser and G. H. the indorsee or ultimate holder. Acceptance in the case both of inland and foreign bills of exchange

must now be in writing on the bill, and signed by the acceptor, or some person duly authorized by him. In England, the mode of acceptance is by the acceptor simply signing his name across the bill, or with the word "accepted" before his name; but in Scotland acceptance is usually made by the acceptor signing his name immediately under the drawer. There are certain precautions to be observed before accepting. The drawee should, upon presentment for acceptance, and before he accepts, assure himself that the signature of the drawer is genuine, and that there has not been a fraudulent substitution of a larger sum than that originally inserted in the bill by the drawer. And if the drawee accept a forged bill, or a bill for a larger amount than that originally named by the drawer, he will nevertheless be liable to pay a *bona-fide* holder; nor will he have any right to recover against the drawer for the larger amount. There is also acceptance *supra protest*, which takes place where, after a foreign bill has been protested for non-acceptance, but not before, the drawee or any other person may accept it *supra protest*, which acceptance is so called from the manner in which it is made. And where the drawee of a foreign bill cannot be found, or is not capable of making a contract, or refuses to accept, this description of acceptance is frequently made in order to save the credit of all or some of the parties to the bill, and prevent legal proceedings. In this country it is called an acceptance for the honor of the person or persons for whose use it is made, and in France an acceptance *par intervention*. It had been a question in England what amounted to a qualified acceptance, but that was set at rest by the 1 and 2 Geo. IV. c. 78 for England, and 9 Geo. IV. c. 24 for Ireland, which required an acceptance, in order to be a qualified acceptance, to express that the bill is "payable at a banker's house or other place only, and not otherwise or elsewhere." And now, as against the acceptor, the absence of these words from the acceptance leaves it at large, an unqualified acceptance, not requiring presentment at a particular place, notwithstanding that, in the body of the instrument, a particular place of payment is expressly specified by the drawer. There may likewise be conditional acceptance—that is, acceptance in such a form as will subject the acceptor to payment of the bill on a contingency only, of which there are numerous examples in the law reports; for instance, to pay "as remitted for," or on account of the ship *Thetis*, when in cash, for the said "vessel's cargo," or on condition of getting a certain house by a given term, or when certain goods are sold, or when certain funds come to hand.

The bill as a negotiable instrument being thus complete in all its parts, may either be held by the drawer or other payee till due, when it may be presented for payment to the acceptor, or it may at once be transferred by *indorsement* (q.v.), the indorsee taking it for its value at maturity, and in the mean time cashing or discounting it to the holder. There may be a succession of indorsees, the last of whom is entitled to payment; and to him all the other indorsees, as well as the drawee and drawer, are bound.

When the bill comes to maturity—that is, when the period arrives for its presentment—it must either be at once paid, or the parties must arrange for its *renewal* (q.v.). If the latter course is not agreed on, and the necessary funds are not forthcoming, the holder can only then proceed to recover at law; and this is now done in a very speedy form under a recent act, the 18 and 19 Vict. c. 67. This act, however, does not extend to Ireland, where the old form of action still prevails. But in Scotland payment of bills may be enforced even more summarily without any action, under the severe provisions of two old Scotch acts passed in 1681 and 1696. See INDORSEMENT, PROMISSORY-NOTE, RENEWAL. Bills are sometimes drawn "at sight," "on demand," or at "one day's date;" and in these cases it is doubtful whether the three days of grace allowed for payment beyond the literal time specified in the document are applicable. Unless in special cases, bills, by the statute of limitations (see LIMITATION) in England, and by prescription (q.v.) in Scotland, do not cease to be valid documents for six years.

In the United States there has sprung up a method of dealing with bills of exchange which is not much known in England. This consists in selling bills without a concurrent obligation by indorsement to make them good. Instead of discounting his bills in the usual form through a banker, a merchant in New York will sell his bills to a broker or dealer in this kind of instrument, the price paid being according to the state of the money-market and the creditworthiness of the acceptor. In such cases, the purchaser stands in the place of the drawer, undertakes all risks, and as custodier of the bill, has the power of legally exacting payment. This method of transacting with bills is called discounting *without recourse*.

ACCOMMODATION BILL. A bill in its legitimate sense is a document constituting a debt, and as such is beneficial to all parties connected with its negotiation. A owes B £100. A cannot conveniently pay the amount, while B is in need of it; B draws on A, and C (a banker) discounts, i.e., for a consideration pays the amount to B. B thus gets the money at once, A obtains time, while C makes a profit for advancing. These facilities have had the effect of inducing bills to be resorted to for raising money where no value is given, and in which one party gives the use of his name for the *accommodation* of another. In the above case, for example, let us suppose that A does not owe B, but yet accepts B's draft. If C discounts the bill, it is immaterial whether he knows that A has got value or not—as an onerous holder, he can compel payment from A if B cannot pay the bill. But if merely in B's hands, the amount is not recoverable from A if the latter can prove that no value was received by him. Accommodation bills give rise to

much fraud and rash speculation, and many attempts have been made to suppress the system; but it is difficult to do so without unduly interfering with the negotiation of *bona-fide* bills.

BILL OF EXCHANGE (*ante*). In this country an inland bill of exchange is one of which the drawer and drawee live in the same state; if the drawee lives in another state or country, it is called foreign. A bill of exchange is negotiable, and may pass through any number of hands before payment. The transfer may be by indorsement either "in blank" or "in full;" the first method requires only the name of the payee upon the back, in which case the bill passes from hand to hand as payable to bearer; in the second method a person is named to whom payment is to be made, whose indorsement then becomes necessary to a further transfer. When so indorsed as to be made payable to bearer, it becomes, like money, the property of whomsoever receives it in good faith and for a consideration, even from a thief. If the drawee, upon presentation, refuses to pay, the indorser becomes liable to the holder. If the last indorser is compelled to pay in full, he may in turn recover in full from either of the preceding indorsers. The holder, however, is not required to pursue any prescribed order as between the indorsers, but may bring suit against whichever of them he prefers; and the one thus selected has the same right of action against any preceding indorser. Where a bill is made payable by successive indorsements to several payees, they are liable jointly, and only for their respective shares.

In law, every indorsement is held to be a contract, so that, though the original bill should be void, the indorser will yet be responsible. If the payee assents to a conditional acceptance of an unconditional bill, he is bound thereby; but he is not obliged to take such an acceptance. If the drawee refuses to pay, "protest" is usually made, as in case of the non-payment of a promissory note due to a bank. Notice to the drawer and indorsers must be promptly given in this or some other form. Bills of exchange are made payable either "at sight," or in a certain number of days "after sight." The drawee is entitled to "three days' grace" before payment. If the holder, for a consideration, agrees with the drawee to extend the time of payment, the drawer and indorsers are discharged unless they give their assent to such agreement.

BILL OF HEALTH, a certificate or instrument, signed by consuls or other proper authorities, delivered to the masters of ships at the time of their clearing out from all ports or places suspected of being particularly subject to infectious disorders, certifying the state of health at the time that such ship sailed. A *clean* bill imports that at the time the ship sailed no infectious disorder was known to exist. A *suspected* bill, commonly called a *touched* patent or bill, imports that there were rumors of an infectious disorder, but it had not actually appeared. A *foul* bill, or the absence of a clean bill, imports that the place was infected when the vessel sailed. See M'Cullough's *Commercial Dictionary*.

BILL OF INDEMNITY, an act of parliament, passed every session, for the relief of those who have unwittingly or unavoidably neglected to take the necessary oaths, etc., required for the purpose of qualifying them to hold their respective offices. See ACT OF INDEMNITY, and ABJURATION.

BILL OF INDICTMENT, a written accusation, charging a person or persons with crime or misdemeanor, presented by a grand jury, usually through the district attorney. If the jury believe that the person ought to be tried they "find," or return, "a true bill;" if the evidence does not warrant a trial, the return is, "not a true bill," or "not found."

BILL OF LADING is a receipt from the captain of the vessel to the shipper (usually termed the *consignor*), undertaking to deliver the goods—on payment of freight—to some person whose name is therein expressed, or indorsed thereon by the consignor; and the delivery of this instrument—independently of the actual delivery of the goods—will suffice to pass and transfer to the party so named (usually termed the *consignee*), or to any other person whose name he may think fit to indorse thereon, the property in such goods; and by a recent statute, 18 and 19 Vict. c. 111, it is now expressly provided that every consignee and every indorsee of a B. of L. shall also have transferred to him all rights of suit, and be subject to the same liabilities in respect of the goods as if the contract in the B. of L. had been made with himself. It is also provided that every B. of L. shall be conclusive evidence of the shipment made. The act, however, declares that nothing contained in it shall prejudice or affect any right *in transitu*, or any right to claim freight against the original shipper or owner, or any liability of the consignee or indorsee, by reason or in consequence of his being such consignee or indorsee, or of his receipt of the goods, by reason or in consequence of such consignment or indorsement. See STOPPAGE IN TRANSITU.

BILL OF LADING (*ante*), formerly a careful contract for the transportation of wares by water, and confined almost entirely to shipping; but latterly applied to any sort of transportation, so that even the slightest memorandum given by a common carrier may be a bill of lading.

BILL OF PARTICULARS, an informal statement of a plaintiff's cause of action or of a defendant's set-off, containing the items of a claim and showing how they arose.

defendant, in giving notice or pleading set-off, must give a bill of particulars, or he will be precluded from giving evidence in support of it at the trial.

BILL OF PRIVILEGE. In England, the form of proceeding against an attorney of the court, who is not subject to arrest.

BILL OF RIGHTS (*ante*). The federal constitution makes no special declaration of personal rights, but nearly all the state constitutions supply the omission, some of them at great length. The bill of rights is merely a statement of those national and political immunities that all men enjoy and share in common.

BILL OF RIGHTS. See RIGHTS.

BILL OF SALE is a writing under seal, evidencing a grant or assignment of chattels personal. The occasions to which these instruments are commonly made applicable are sales of fixtures and furniture in a house; of the stock of a shop, of the good-will of a business, of an office, or the like. But their most important use is in the transfer of property in ships, which, being held in shares, cannot, in general, be delivered over on each change of part ownership. Such bill of sale may be either absolute or conditional: in the former case, operating as a conveyance, and in the latter, as a security. By the 17 and 18 Vict. c. 36, passed to prevent frauds upon creditors by secret bills of sale, it is provided that every bill of sale must be filed in the court of queen's bench within 21 days after its execution, together with an affidavit of the time of such bill of sale being given, and a description of the residence and occupation of the deponent, and of every attesting witness of such bill of sale, otherwise it will be void, as against assignees in bankruptcy and insolvency, and creditors. The residence and occupation of each attesting witness should appear in the bill of sale, and also in the affidavit.

Notwithstanding these precautions, the practice of disposing of various kinds of movable property, more particularly household furniture and stocks of goods in trade by bill of sale, leads to great and injurious deceptions; for as the seller, by an arrangement with the buyer, sometimes retains possession, and is in the eye of the world as much the proprietor as ever, he is enabled to carry on his affairs, and get credit as usual. See REPUTED OWNERSHIP.

BILL OF SIGHT. The law on this subject is regulated by the customs regulation act, 3 and 4 Will. IV. c. 52, s. 24 and 25, and is to the effect that when a merchant is ignorant of the real quantities or qualities of any goods assigned to him, so that he is unable to make a perfect entry of them, he must acquaint the collector or comptroller of the circumstance; and the collector is authorized, upon the importer or his agent making oath that he cannot, for want of full information, make a perfect entry, to receive an entry by bill of sight for the packages, by the best description which can be given, and to grant warrant that the same may be landed and examined by the importer, in presence of the officers; and within three days after any goods shall have been so landed, the importer shall make a perfect entry, and shall either pay down the duties, or shall duly warehouse the same. In default of perfect entry within three days, such goods are to be taken to the queen's warehouse; and if the importer shall not within one month make perfect entry, and pay the duties thereon, or on such parts as can be entered for home use, together with charges of moving and warehouse rents, such goods shall be sold for payment of the duties.

BILL OF STORE, a license under the customs regulation act, the 3 and 4 Will. IV. c. 52, granted by the custom-house to merchants to carry such stores and provisions as are necessary for a voyage, custom-free.

BILL OF VICTUALING, or VICTUALING BILL, is a document relating to the stores put on board a ship when leaving a British port; it is a safeguard in reference to customs duties, and is regulated by a clause in an act passed in 1853. The master of a ship, on leaving a British port, for a voyage which (out and home) will not occupy less than 40 days, receives from the customs authorities an order or permission for the shipment of such stores and victuals as may be required—the data being the number of crew and passengers, and the probable duration of the voyage. When these are shipped, the master prepares a correct account of them, and of any other stores at that time in the vessel, and this account, when approved and countersigned by the customs officers, constitutes the victualing bill. No stores are allowed to be taken on board the ship, nor any articles taken on board to be deemed as stores, unless they be specified in this document.

BILLOM, a t. of France, in the department of Puy-de-Dôme, situated on a hill 14 m. e.s.e. of Clermont. It is one of the most ancient towns of Auvergne, and was formerly surrounded by walls, which have now disappeared; its commerce and manufactures have also declined. So early as 1455, a university was founded at Billom, which a century later passed into the hands of the Jesuits, and was governed by them until the suppression of their order. Pop. '76, 3,737, chiefly engaged in the manufacture of earthenware.

BILLON (see BULLION) is an alloy of copper and silver, in which the copper predominates, and which is used in some countries for the smaller denominations of money. The *groschen* of North Germany—e. g., corresponds nearly to an English penny—is of

B., and is about the size of an English fourpenny silver-piece. The object is to avoid the bulkiness of copper coin; but B., besides affording facilities for counterfeits, is dirty and inelegant.

BILLS OF MORTALITY are accounts of the births and deaths within a certain district; and they were an expedient, with the view of communicating to the inhabitants of London, to the court, and to the constituted authorities of the city, accurate information respecting the increase or decrease in the number of deaths. These bills were commenced in 1592, during a time when the plague was busy with its ravages; but they were not continued uninterruptedly until the occurrence of another plague in 1603, from which period, up to the present time, they have been continued from week to week, excepting during the great fire, when the deaths of two or three weeks were given in one bill. In 1605, the parishes comprised within the B. of M. included the 97 parishes within the walls, 16 parishes without the walls, and 6 contiguous out-parishes in Middlesex and Surrey. In 1662, the city of Westminster was included in the bills; in 1636, the parishes of Islington, Lambeth, Stepney, Newington, Hackney, and Redriff. Other additions were made from time to time. At present, the weekly B. of M. include the 97 parishes within the walls, 17 parishes without the walls, 24 out-parishes in Middlesex and Surrey, including the district churches, and 10 parishes in the city and liberties of Westminster. The parishes of Marylebone and St. Pancras, with some others, which, at the beginning of last century, had only 9150 inhabitants, but now contain a rapidly increasing population, were never included in the bills.

But these bills are now, from want of proper machinery, of little or no value, and the only true bill is now that prepared at the register-general's office, under the new registration act. The first of these weekly bills was commenced Jan. 11, 1840, and the series has been continued from that time without interruption. See Wharton's *Law Dictionary*, 2d edition, 1860, and Knight's *London*.

BILL, TRUE. See BILL OF INDICTMENT.

BILMA, a t. of the Sahara, Central Africa, situated in lat. 18° 40′ n., long. 14° e., on an oasis called the Wady Kawas, on the route between Murzuk and lake Tsad. It is the capital of the Tibu country, and important as a resting-place of caravans crossing the desert. Dates grow abundantly here; and large quantities of salt are collected from lakes in the vicinity for export to Bornu and Sudan.

BILSA, or BHILSA, a t. of India, in Malwa, in the territory of Gwalior, Scindia's dominions, on the right bank of the Betwa, 188 m. s. from Gwalior, and 32 m. n.e. from Bhopal. It is situated on an elevated mass of trap rock, and has a fort inclosed by a stone wall, and furnished with square towers and a ditch. Outside the walls are some spacious streets, and many good houses. B. was taken from the Hindus by Samsuddin Altamsh, sovereign of Delhi, in 1230; and after several times changing hands between Hindu and Mussulman masters, was finally incorporated with the empire of Delhi by Akbar, in 1570. The population is about 30,000. B. and the pergunnah of which it is the capital, are said to yield a revenue of 325,000 rupees. The finest tobacco produced in India is from a small piece of land, about three acres, near Bilsa. Its superiority is said to be entirely owing to careful cultivation. There is at B. a brass cannon, of beautiful workmanship, said to have been made by order of Jehangir, 19½ ft. in length, with a bore of 10 in.

BILSON, THOMAS, 1536–1616; an English author, bishop of Worcester and Winchester, and a member of the privy council. Among his works are *The True Difference between Christian Subjection and Unchristian Rebellion* (a vindication of queen Elizabeth's course toward the low countries), *The Perpetual Government of Christ's Church*, etc.

BILSTON, a t. in South Staffordshire, situated on a rising ground about 3 m. s.e. of Wolverhampton. Pop. '71, 24,188. It forms a part of the parliamentary borough of Wolverhampton. It has extensive iron and coal mines, iron smelting-works, iron-foundries for making machinery, besides works for manufacturing tinplate goods, japanned and enameled wares, nails, wire, screws, and coarse pottery. It is the center, indeed, of the hardware trade, and consequently a very busy place. Fine sand, adapted for metal-casting, is found here. Upwards of 700 persons died of cholera here both in 1832 and 1849.

BI'MA, a seaport in Sumbawa, one of the Sunda isles, and capital of a state of the same name, in lat. 8° 30′ s., and long. 119° east. It is on a bay of the n. coast, being 100 m. to the e. of Sumbawa, a town feudally dependent on its sultan. Its chief exports are horses and timber.

BI'MAH, a river of India, a branch of the Kistnah (q.v.), rises in the table-land of the district of Poona, in the presidency of Bombay, at an elevation of 3090 ft. above the level of the sea, and following in a south-eastward direction, falls into the Kistna, in n. lat. 16° 24′, e. long. 77° 20′, after a course of more than 500 miles.

BI'MANA (Lat. two-handed), in some zoological systems, the first order of *mammalia* (q.v.), an order containing the human species alone. See MAN. Others reject this order altogether, reclaiming against this classification of man with brutes, and maintaining

that the distance between him and them is too great to be represented as that between two orders in one class, or even between two classes of a zoological system. In assigning a place in this manner to man among animals, naturalists of course consider exclusively or chiefly his animal nature and bodily frame. The name B. has reference to the hands (q.v.) which terminate his anterior limbs; monkeys and lemurs, which, having opposable thumbs in all the four extremities, may be regarded as having four hands, although much less perfect than the human, are called *quadrumana* (q.v.); but none of the inferior animals are *two-handed*, as man is.

BIMI'NI, an island that never existed, supposed by Ponce de Leon to be among the Bahamas, and to contain the fountain that had power to restore youth and beauty. He found Florida, but neither any such island, nor any remarkable fountain.

BINAB', a t. of Persia, in the province of Azerbijan, charmingly situated on the banks of the Sofi Chai (a feeder of lake Urumiyah), in the midst of orchards and vineyards, about 55 m. s.s.w. of Tabriz. B. contains about 1500 houses; the streets are very clean, many of them having a stream of pure water, which is here very plentiful, flowing down the center. B. forms a dependency of Marághah, paying 4000 tómáns of revenue, and furnishing a quota of 400 men to the Azerbijan army.

BI'NARY COMPOUND. See BINARY THEORY.

BI'NARY STARS. See DOUBLE STARS.

BI'NARY THEORY, in chemistry, takes cognizance of the mode of construction of salts. It assumes that all salts contain merely two substances, which either are both simple, or of which one is simple, and the other a compound playing the part of a simple body. The best and most familiar illustration of the B. T. is common salt or chloride of sodium (NaCl), which is constructed of the metal sodium (Na) and the non-metal chlorine (Cl), and is at a glance seen to be a *binary compound* (a compound of two). In like manner, fluor-spar, or the fluoride of calcium (CaF), consists of the metal calcium (Ca) and the non-metal fluorine (F); iodide of potassium (KI), largely employed in photography, of potassium (K) and iodine (I); and bromide of silver (AgBr), also useful in photography, of silver (Ag) and bromine (Br). Considerable difficulty is experienced in including all salts under the B. T., but in many cases the apparent difficulty may be got over. Thus, saltpeter, or the nitrate of potash (KO,NO_5), according to the ordinary mode of representing its composition in symbols, naturally breaks up into potash (KO) and nitric acid (NO_5); but in this form it cannot be correctly included in the B. T. If, however, the same elements be arranged differently, as when the nitrate of potash (KNO_6) is represented as containing the metal potassium (K) and the compound non-metal nitrationide (NO_6), the latter playing the part of chlorine or other simple substance, the apparent barrier to the introduction of such salts into the list of those comprehended under the B. T. to a great extent disappears. The following table will represent this more clearly:

	SYMBOLS.	
	Ordinary Way.	Binary Theory.
Chloride of sodium	Na,Cl	Na,Cl
Nitrate of potash	KO,NO_5	K,NO_6
Sulphate of soda	NaO,SO_3	Na,SO_4
Carbonate of lime	CaO,CO_2	Ca,CO_3

Much, however, remains to be cleared up, and in very many cases the B. T. does not answer the purpose of including all salts under one class. See SALTS; see also CHEMISTRY.

BINAS'CO, a t. of Lombardy, about 11 m. n.w. of Pavia. It is defended by a castle, where, in Sept., 1418, Beatrice di Tenda, wife of the duke Filippo Maria, was beheaded by order of her husband, who unjustly suspected her of infidelity. Pop. about 1000.

BIN-BIR-KILISA' (One Thousand and One Churches), the name of extensive ruins in the pashalic of Karamania, Asia Minor, and 20 m. n.n.w. of the town of Karaman. The ruins consist chiefly of the remains of Byzantine churches, evidently of great antiquity, and some of very considerable size. B. is supposed to be the ancient Lystra, where the cripple was healed by St. Paul.

BINCHE, a t. of Belgium, province of Hainaut, on the Haine, about 10 m. e.s.e. of Mons. It is well built and walled, with a fine square, ornamented with a fountain, and has manufactures of leather, cutlery, pottery, glass, etc., and a considerable trade in lace, paper, marble, and coal. Pop. '70, about 7000.

BINDRABAN', a t. on the right bank of the Jumna, is situated in the district of Muttra and lieutenant-governorship of the n.w. provinces. It is in lat. 27° 34′ n., and long. 77° 45′ e., being 823 m. to the n.w. of Calcutta, and 92 to the s. of Delhi. The population of B., almost exclusively Hindu, was, in 1871, 21,500. The performance of religious rites appears to be the principal business of the place. Crowds of pilgrims come from all parts of India, more particularly in honor of Krishna; and, through the munificence of wealthy devotees, sacred edifices are constantly becoming more numerous and costly. Here, as at Benares, the immediate margin of the river is occupied by flights

of steps, or ghauts, as they are called. These extend for about a mile along the bank, being constructed of red stone, which is brought from Jeypore, nearly 150 m. distant.

BINDWEED. See CONVOLVULUS.

BINGEN (the ancient *Vincum* or *Bingium*), a t. in the grand-duchy of Hesse-Darmstadt, Germany, is situated in a charming country on the left bank of the Rhine, and on the right of the Nahe, here crossed by a bridge, generally supposed to have been built by the Romans, and called the bridge of Drusus. Pop. '75, 6404, who are chiefly engaged in the manufacture of fustian, leather, flannel, and tobacco. The vine is extensively cultivated in the surrounding country. The celebrated Scharlachberger wine is produced in the vineyard of the same name, near the village of Rüdesheim. In the vicinity of the town is the Rochusberg, with a chapel, to which annual pilgrimages are made. On the declivity of the hill are still to be seen the ruins of the old castle (blown up by the French in 1689), in which the emperor Henry IV. was detained a prisoner by his son in the year 1105. On the other side of the Nahe is the Rupertsberg, with the ruins of a monastery, in which St. Hildegarde resided in the 12th century. Below the town is the celebrated *Bingerloch*, formerly a very dangerous point in the navigation of the Rhine, on account of the sunk rocks which, with the exception of a narrow passage through which the waters rushed loud and furious, stretched across the river; but, in the year 1834, these rocks were partially blown up, so that there is no longer any great danger. In the middle of the river stands the tower, in which, according to the legend, bishop Hatto was devoured by rats in the year 969. History, however, fixes the date of the erection of the tower in the 13th c., as a toll-house for the collection of duties on goods passing this point in the river.

BINGHAM, HIRAM, 1790–1869; b. Vt.; a Congregational minister, graduate of Middlebury college and Andover seminary, and first missionary to the Sandwich islands, where he remained until 1841.

BINGHAM, JOSEPH, 1668–1723; an English clergyman, educated at Oxford; a tutor in the college in 1691, and a rector near Winchester somewhat later. Here he wrote his valuable *Antiquities of the Christian Church*. He was subsequently rector at Havant, near Portsmouth. Like many other simple souls of the period, he lost his little property in the "South sea bubble."

BINGHAMTON, a city in Broome co., N. Y., beautifully situated at the junction of the Chenango and the Susquehanna rivers, at the mouth of the Chenango canal, and on three railroads, the New York and Erie, the Syracuse and Binghamton, and the Albany and Susquehanna; pop. '75, 15,518. It is in a fine agricultural region, a few miles n. of the Pennsylvania line, and has a large local and canal and railroad trade. The rivers furnish abundant water-power, and there are a number of large manufactories. The most important public institution is the New York state asylum for inebriates, which has been in successful operation for several years. Other institutions are the Dean college, the Binghamton academy, a Roman Catholic academy, a high-school, and a dozen or more churches. Three daily and five weekly newspapers are issued here. B. was one of the earliest settlements in that section of the state. It is 214 m. n.n.w. of New York, and 142 m. s.w. of Albany, by rail.

BINGLEY, a t. and township in the West Riding of Yorkshire, 15 m. w.n.w. of Leeds, situated on an eminence in a well-wooded district, between the Aire and the Leeds and Liverpool canal. It chiefly consists of one long street. It has considerable worsted, cotton, and paper manufactures. Pop. '71, 15,952.

BINNACLE, formerly called *bittacle* (Fr. *habitacle*), is a wooden box or case for containing a ship's compass, together with other apparatus (especially a lamp) essential to its use. In large ships, there are generally two binnacles, one for the steersman, and one for the officer or seaman who "cons" or superintends the steering. Sometimes a lamp is so placed as to illuminate two compasses at night, sometimes only one. Many improvements have recently been made in binnacles. See COMPASS, MARINER'S.

BINNEY, AMOS, 1803–47; b. Boston; educated at Brown University, studied medicine, became a merchant, and afterwards devoted himself to science, being one of the founders and the first president of the Boston society of natural history, and of the American association of naturalists and geologists, over which he presided until his death. As a legislator, he promoted the scientific survey of the state; he wrote many valuable papers in the journal of the natural history society; devoted years to the study of mollusks, and wrote *Terrestrial and Air-breathing Mollusks of the United States and Adjacent Territories of North America*, which was published with fine illustrations after his death.

BINNEY, HORACE, LL.D., 1780–1875; b. Philadelphia; a distinguished lawyer, for many years at the head of the Pennsylvania bar; director in the U. S. Bank, and trustee to wind up its affairs. He was a member of congress in 1833–35, but held no other political office. One of his great cases was the defense of the city of Philadelphia against the suit of certain heirs of Stephen Girard. He wrote *The Leaders of the Old Bar of Philadelphia*, *The Privilege of the Writ of Habeas Corpus Under the Constitution*, and many valuable unpublished papers.

BINNEY, Rev. THOMAS, D.D., LL.D., one of the most distinguished modern preachers of the independents in England, was b. at Newcastle in 1798. After officiating as a clergyman in Newport, Isle of Wight, he in 1829 removed to London, where he soon acquired extensive popularity. The hall in which he preached becoming too small for his congregation, Weigh-house chapel, near London Bridge, was erected for him by his hearers in 1833. Here he continued to labor with great success for nearly 40 years, attracting around him a large number of the more intelligent class of young men in the metropolis. An address delivered at the opening of the new chapel, containing animadversions on the English church, brought B. into notoriety from the replies it called forth from many English clergymen. He afterwards took the more liberal side in the *Rivulet* controversy regarding the orthodoxy of certain hymns of high poetic merit, written by the Rev. T. Lynch of London. In 1845 he visited Canada and the United States; and in 1857–59 made a successful preaching and lecturing tour in Australia. He resigned in 1871 the pastorate of Weigh-house chapel. As a preacher, B. was remarkable less as an orator than for breadth of view, originality of thought, and force of expression. Among the most popular of his religious works are: *Conscientious Clerical Nonconformity, The Practical Power of Faith, Service of Song in the House of the Lord, Money,* and *Is it Possible to make the Best of Both Worlds?* He died in 1874.—See *Memorial of B.,* edited by John Stoughton, D.D., 1875.

BINOCULAR MICROSCOPE, a microscope adapted to be used by both eyes at the same time. It has only one set of object glasses, but the pencil of light, after passing these lenses, is divided, and the parts are sent to the eyes separately. The division is caused by a trapezoidal prism that is pushed latterally into the pencil of light, cutting off one half; the other half goes on directly to one eye. That part of the pencil which is obstructed enters the lower face of the prism normally and is not there changed; it meets the second face internally at such an angle as causes it to be wholly reflected and to pass back through the glass to the third face; here it is again totally reflected, and it passes thence out of the glass normally through the fourth face. The result at all these changes of direction is to give it a path, slightly oblique, to that of the unchanged ray, that will carry it through an oblique tube to the second eye. The rays of light cross in the objective; hence, to obtain a stereoscopic effect—that is, to cause the object to stand forth as a solid, its three dimensions being properly appreciated—the light which comes from the left side of the object must enter the right eye, and *vice versa.* Should the light from the right side enter the right eye, a pseudoscopic effect follows; projections seem hollows, and hollows look like elevations. The binocular microscope has two eye pieces. It is restful to the eyes, and with low powers gives information not to be had otherwise, showing the depth, as well as the length and breadth, of the thing observed. The binocular telescope has two tubes and two sets of lenses throughout. A pair of opera-glasses is a familiar example.

BINO'MIAL, in algebra, is a quantity consisting of two terms or parts—e.g., $a+b$, or $9-5$; a *trinomial* consists of three terms, as $a+b+c$, or $10+5-8$. The BINOMIAL THEOREM is that remarkable series of analytical formula by which any power of a B. can be expressed and developed. Thus, the 8th or any other power of $a+b$ can be at once written down without going through the actual multiplication of $a+b$ by itself for the given number of times. The older mathematicians were acquainted with this theorem in the case of integral exponents, though the actual discoverer is unknown. Newton was the first to demonstrate its truth for all exponents—fractional and negative, as well as integral. It is one of the finest of his discoveries, and is engraved on his tomb. Among its many applications, it affords the means of finding any root of any number much more conveniently than by the usual method of extraction.

BINON'DO, a t. of the island of Luzon, Philippines, on the right bank of the Pasig, opposite to Manilla, with which it is connected by a magnificent stone bridge, 411 ft. in length. This bridge is regarded as the greatest structure erected by Europeans in the east. B. is chiefly inhabited by natives of the Philippines, but is also the residence of some Europeans. It is the seat of government of the province of Tondo. Pop. 29,200.

BINTANG', an island of the Dutch East Indies, about 40 m. s.e. of Singapore, and in lat. 1° 5′ n., long. 104° 29′ east. Area, 600 sq. miles. Pop., including that of small adjacent isles, 13,000. It is calculated that not less than 4000 tons of the astringent gum called gambir are obtained here annually. This, along with rice and pepper, forms its chief exports.

BINTURONG, *Ictides,* a genus of quadrupeds nearly allied to raccoons (q.v.), from which the chief distinction is in the smaller and less tuberculated back molar (grinder) teeth. Only two species are known, natives of Malacca, Java, Sumatra, etc.

BI'OBI'O, the largest river of Chili, has a w.n.w. course from the Andes to Concepcion on the Pacific, being 2 m. wide at its mouth, and navigable for boats from the sea to the mountains. Its lower stream separates the province of Concepcion on the n. from independent Araucania on the south.

BIOGRAPHY (from the Gr. *bios*, life, and *graphē* writing) is the term applied to that department of literature which treats of the lives of individuals. The mode of treatment, especially in modern times, is far from uniform. In some cases, B. approaches the sphere of philosophy; in others, that of history; while in the majority it assumes, to a large extent, the character of analytic or descriptive criticism. To none of these modes, theoretically considered, can there be any valid objection; everything depends on the judiciousness of the biographer. The great points which he must keep perpetually in view are the personality and characteristics of his subject. If these are buried under a load of digressive dissertations, his book, however valuable or interesting, ceases to be a B., except in name. Anciently, B. was more of a mere *curriculum vitæ* than it is now; that is to say, the leading incidents of a man's life were narrated in their historical sequence, without any elaborate attempt to analyze the character from which they emanated. Like ancient history, it was possessed of a simple greatness, a stately dignity of narrative, colored here and there but sparingly with grave eulogy or censure. Modern B., on the other hand, like modern history, is full of elucidations, criticism, and disquisition; and if wanting in the severe grace of its classic predecessor, it is much more lively, acute, and expansive.

Biographical literature appears to have existed from a very early period. The oldest historical books of the Jews abound with beautiful examples of it, such as the lives of the patriarchs and the story of Ruth. But what, indeed, are the mythologies of all ancient nations, except a chaos of heroic or divine biographies written not on walls of stone or rolls of parchment, or leaves of papyrus, but on the tablets of the memory? Of purely biographical works, the most valuable that has come down to us from the Greeks is the *Parallel Lives* of Plutarch, a composition of the 2d c. after Christ. Roman literature also possesses an admirable specimen in the *Life of Agricola* by his son-in-law, Tacitus. Besides these may be mentioned the *Life of Alexander the Great* (in Latin) by Curtius, and of *Apollonius of Tyana* (in Greek) by Philostratus, *Lives of the Sophists* (in Greek) by Philostratus, and a *Life of Plato* (in Greek) by Olympiodorus of Alexandria.

Coming later down, we encounter St. Jerome's *Lives of the Fathers;* while biographies, more or less complete, of saints, martyrs, bishops, etc., are scattered profusely through primitive ecclesiastical literature. The monks of the middle ages also worked hard at the manufacture of absurd and superstitious legendary biographies, in which the hunger for the marvelous characteristic of that credulous time was hugely gratified. Modern biographical literature may be said to date from the 17th c., and has since developed itself to an unmanageable extent. Among the most valuable works belonging to this class, written since the reformation, may be mentioned Vasari's *Lives of the Painters* (Florence, 1550); the *Acta Sanctorum* (q.v.); Tillemont's *Mémoires pour servir à l'Histoire Ecclésiastique des six Premières Siècles de l'Englise*, in 16 vols. 4to (Paris, 1693); Thomas Stanley's *History of Philosophy, containing the Lives, Opinions, Actions, and Discourses of Philosophers of every Sect* (1655–62); Bayle's *Dictionaire Historique et Critique* (Rotterdam, 1697); Johnson's *Lives of the Poets* (completed in 1781); the *Biographie Universelle* (1810–28); *Conversations-Lexicon* (10th edition, 1851–55); Charles Knight's *English Cyclopædia*, biographical section (1856–57). As for individual biographies in modern times, it would be endless to enumerate them. It having unhappily been discovered that these constitute the most attractive form of literature, the world is annually inundated with an intolerable flood of lives of nobodies. At present, the most insignificant literary, clerical, or philanthropical personages are not permitted to pass quietly away. Nevertheless, amid the desert of commonplace, the choicest oases may be found; works so rich in pleasant or profound thought, so copious in agreeable gossip, so valuable in unexpected glimpses and revelations of character, so abundant, in short, in everything that can stimulate, elevate, or enlighten, that it is not wonderful they should be read and re-read with avidity. Chief among such in our own country is Boswell's *Life of Johnson* (1790). During the present century also appeared the *Life of John Sterling*, by Thomas Carlyle, a work which is considered a model of its kind; and the *Life of Goethe* by G. H. Lewes, which has been universally accepted, both in Germany and England, as an adequate B. of the illustrious monarch of continental literature. In France, where B., at least in the shape of "memoirs," has attained perfection, we may specify among others the *Life of Descartes* by Baillet, of *Charles XII.* by Voltaire, of *Voltaire* by Condorcet, of *Fénélon* and *Bossuet* by cardinal de Bausset, of *Molière* and *Corneille* by M. Taschereau, and of *Monk* by Guizot. In Germany, among others, we have the *Life of Heyne* by Heeren, of *Reinhard* by Poelitz, and of *Dorothea, Duchess of Courland*, by Tiedge; while America has contributed the valuable *Life of Christopher Columbus* by Washington Irving.

An *autobiography* is the life of a person written by him or her self. This branch of literature, also, has become superabundant in this egotistic and self-conscious age. Unquestionably the highest work in this department of literature is Goethe's *Dichtung und Wahrheit*, a kind of idealized autobiography, in which the outward and inward truth, the fact and poetry of the author's life, are strangely but beautifully interwoven.

BIOLOGY (Gr.), or the science of life, embraces properly all knowledge regarding organized beings as distinguished from the inorganic world. But in a narrower sense it designates much the same as human physiology (q.v. and LIFE).

BIOLOGY (*ante*), a title under which are classed the sciences that deal with the phenomena manifested by living matter. It is customary to make a separate group of such phenomena as pertain especially to mental organization, under the titles of "psychology" and "sociology," but no natural line can be assigned as separating the subject-matter under those heads from the more comprehensive term at the head of this article. Psychology is closely connected with physiology; while there are phases of social life exhibited by animals, as well as men, which come within the province of the biologist. The biological sciences, on the other hand, are distinctly separated from those which treat of non-living matter, so far as the properties of living matter distinguish it clearly from all other things, and inasmuch as the present state of knowledge furnishes no link between the living and the non-living.

The distinctive PROPERTIES OF LIVING MATTER are: 1. Its *chemical composition*, consisting always of one or more complex forms of a compound of carbon, hydrogen, oxygen, and nitrogen, the so-called proteine—which has not been found except as a product of living bodies—joined with a large proportion of water, and forming the chief constituent of a substance which, in its primary state, is called protoplasm. 2. Its *universal disintegration* and *waste by oxidation*, and its *concomitant reintegration by the intussusception of new matter*. A process of waste following the decomposition of the molecules of the protoplasm, in virtue of which they divide into more highly oxidated products which cease to form any portion of the living body, is a constant phenomenon of life. It is thought that one of these waste products is carbonic acid, and that the others contain the remainder of the carbon, nitrogen, hydrogen, and other elements in the composition of the protoplasm. The new matter, received to make good this constant loss, is either already-formed protoplasmic material, supplied by another living thing, or may be elements of the protoplasm united in simpler combinations which have constantly to be built into protoplasm by the agency of the living matter itself. In either case the addition of molecules to those already existing is by interposition between the existing molecules, and not at the surface of the living mass. If the processes of disintegration and reconstruction which characterize life balance each other, the size of the living mass remains stationary; but if the reconstructive process is more rapid than the disintegrative, the living body is enlarged or grows. However, the increase of size which constitutes growth is the result of molecular intussusception, and differs from growth by accretion (as may be observed in crystals), which is effected solely by the addition externally of new matter; therefore, the term "grow" as applied to stones signifies a process entirely different from "growth" of animals and plants. 3. Its *tendency to undergo cyclical changes*. In nature's ordinary course all living matter proceeds from pre-existing living matter, some portion of the latter being detached and acquiring a separate and independent existence. The latest forms have the family characteristics of parentage or descent, the same power and process of reproducing the same life, or nearly so, ending their life after the manner of the parent, and being resolved into more highly oxidated compounds of their elements. A particular living body constantly changes not only its substance, but also its form and size, the end of which is the decay and death of that particular body, the continuation of its kind being provided for by the detachment of parts, which pass through the same series of forms as the parent. No forms of non-living matter, not derived from a living source, will exhibit these three properties, nor will they approach to the singular phenomena explained under the above 2d and 3d heads. Living matter has some other peculiarities, the principal of which are: the dependence of all its activities upon moisture (and heat within a limited range) and the fact that it usually has a certain structure or organization. As to *moisture*, there is a large proportion of water in all living matter; drying to a certain point arrests vital activity, and the entire absence of water is incompatible with either actual or potential life. Still, many of the simple forms may be dried so as to appear to be non-living matter while they are yet potentially alive, and on receiving proper moisture may return to active existence months or even years after apparent death. *Temperature* in a proper degree is a necessary condition of life; but more or less heat may destroy life altogether by breaking up the molecular structure on which that life depends. All vital activity, and all the phenomena of nutritive growth, movement, and reproduction are possible only between certain limits of temperature. As the temperature nears these limits the manifestations of life weaken and vanish, though they may recover by a return to normal conditions; but any considerable transcending of the natural limits of temperature must result in death. These limits of temperature are not clearly definable, since they vary widely with varying matter, and with the conditions of moisture that accompany temperature. Satisfactory experiments on these points are possible only among the lowest and simplest forms of life; but it has been shown that organisms in a dry state can bear much greater heat than when moist. The spores of fungi in a dry condition have borne 248° to 257° Fahr., but the same spores when moist were killed at 212°. Dry yeast has borne the surprising temperature of 76° below zero without being killed; and in a moist condition it has been frozen to 23° without killing; but a lower reduction destroyed life. The resistance of living matter to cold depends greatly on the special form of the matter; but it should be added that experiments have not been numerous enough to establish definite limits. There are vegetable growths at great heights in temperate climates, while in the arctic regions they cover wide spaces of snow and ice, where

the cold is extreme and continues for months together; while the polar seas, north and south, swarm with *diatomaceæ* and *radiolaria*. It is on the *diatomaceæ* that all surface life in these regions ultimately depends, and their enormous quantity proves that their rate of multiplication is adequate to meet the demands made upon them, and that it is not seriously impeded by the low temperature of the water in which they habitually live, a temperature seldom much above freezing. Turning to the maximum of heat that life can endure, we find an equally wide variation. Cohn gives the results of a series of experiments conducted with the view of ascertaining the temperature at which *bacteria* are destroyed when living in a fluid of definite chemical composition. He made a fluid containing one tenth of a gramme of potassium phosphate, one tenth of a gramme of crystallized magnesium sulphate, one tenth of a gramme of tribasic calcium phosphate, and two tenths of a gramme of ammonium tartrate, dissolved in 20 cubic centimetres of distilled water. If to this fluid a small portion of water containing *bacteria* was added, the multiplication of the *bacteria* went on rapidly, whether the vessel was open or closed. Such vessels, hermetically sealed, were immersed in water in various temperatures. In those subjected for an hour to 143° Fahr., the *bacteria* underwent no development, the fluid remaining clear; but at even 122° the fluid became turbid in two or three days in consequence of the multiplication of the *bacteria*. It is generally believed that the simpler forms of vegetable life are killed at 140°; but *algæ* live in hot springs at even 208°. Late investigations lead to the conclusion that the immediate cause of the arrest, in the first place, of vitality, and, in the second place, of its destruction, is the coagulation of certain substances in the protoplasm, and that the latter contains various coagulable matters which solidify at certain temperatures.

As to *life* and *organization*, a recent writer remarks: It may be safely said of all living things, large enough to enable us to trust the evidence of microscopes, that they are optically heterogeneous, and that their different parts, especially the surface layers as contrasted with exteriors, differ physically and chemically; while in most living things, mere heterogeneity is exchanged for a definite structure, whereby the body is distinguished into visible parts, which possess different powers or functions. Living things which present this visible structure are said to be "organized;" and so widely does organization obtain among living beings, that "organized" and "living" are not unfrequently used as if they were terms of coextensive applicability. This is not exactly accurate, if it thereby be implied that all living things have a visible organization, as there are numerous forms of living matter of which it cannot properly be said that they possess either a definite structure or permanently specialized organs; though doubtless the simplest particle of living matter must possess a highly complex molecular structure far beyond the reach of vision. The broad distinctions which, as a matter of fact, exist between every known form of living substance and every other component of the material world, justify the separation of the biological sciences from all others. But it must not be supposed that the differences between living and non-living matter are such as to justify the assumption that the forces at work in the one are different from those which are to be met with in the other. Considered apart from the phenomena of consciousness, the phenomena of life are all dependent upon the working of the same physical and chemical forces as those which are active in the rest of the world. It may be convenient to use the terms "vitality" and "vital force" to denote the causes of certain great groups of natural operations, as we employ "electricity" and "electrical force" to denote others; but it ceases to be proper to do so if such a name implies the absurd assumption that "electricity" and "vitality" are entities playing the part of efficient causes of electrical or vital phenomena. A mass of living protoplasm is simply a molecular machine of great complexity, the total results of the working of which, of its vital phenomena, depend on the one hand upon its construction, and on the other upon the energy supplied to it; and to speak of "vitality" as anything but the name of a series of operations, is as if one should talk of the "horology" of a clock.—(*Huxley.*) Other writers, objecting to this use of terms, call attention to the fact that even if the term "vitality" be thus limited in science to a series of operations, the term "life" is not thereby precluded from a larger application.

Coming to the CLASSIFICATION OF THE PHENOMENA OF LIFE, we find that living matter, or protoplasm, and the products of its metamorphoses, may be regarded under four aspects: 1. It has a certain external and internal form, the latter being usually called "structure." 2. It occupies a certain position in space and time. 3. It is the subject of the operation of certain forces, by virtue of which it undergoes internal changes, modifies external objects, and is modified by them. 4. Its form, place, and powers are the effects of certain causes corresponding to these four aspects. Biology is separated into four chief subdivisions, which are: I. Morphology; II. Distribution; III. Physiology; IV. Ætiology.

I. MORPHOLOGY. As far as living beings have form and structure they come within the province of *anatomy* and *histology*, the latter being the name for microscopic analysis of living forms. When the form and structure of a living being are not the same during its whole existence, but undergo changes, such beings have *development*, and the history of development is an account of the anatomy of a living being at successive epochs of its existence, and of the manner in which one anatomical stage passes into another. Finally, the systematic statement and generalization of the facts of morphology, in such

a manner as to arrange living beings into groups according to their degrees of likeness, is *taxonomy*. The study of anatomy and development has brought out certain generalizations of wide applicability and importance.

1. Most plants and animals are aggregates of cells. Ordinary dissection by unassisted vision suffices to separate the body of any of the higher animals or plants into fabrics of different sorts, which in the same organism always present the same general arrangement, but in different organisms are combined in differing manner. The discrimination of these comparatively few fabrics, or tissues, of which organisms are composed, was the first step toward that ultimate analysis of visible structure which has become possible only by recent perfection of microscopes and improved methods of preparation. Histology, which embodies the results of such analysis, shows that every tissue of a plant is composed of more or less modified structural elements, each of which is called a cell; and this cell in its simplest condition is only a mass of plotoplasm, surrounded by a coat or sac called the cell-wall, which contains cellulose. In various tissues the cells may undergo innumerable changes of form, the protoplasm may change into a nucleus with its nucleolus, a primordial utricle, and a cavity filled with watery fluid, and the cell-wall may be altered in composition or structure, or may coalesce with other cell-walls. But however extensive these changes may be, the fact remains clear that the tissues are made up of morphologically distinct units, which are the cells. Every plant, so far as traceable, may be said to commence existence as a simple cell, identical in its fundamental characteristics with the least modified of those cells of which the whole body is composed. Cell-walls, however, are not always necessary. There are plants which spend a portion of their existence in the condition of a spheroid of protoplasm, with nothing like a wall, while at other times the protoplasmic body becomes inclosed within a cell-wall fabricated by its superficial layer. Therefore, just as the nucleus, the primordial utricle, and the central fluid are no essential constituents of the morphological unit of the plant, but represent results of its metamorphoses, so the cell-wall is equally unessential; and either the term "cell" must acquire a merely technical significance as the equivalent of "morphological unit," or some new term must be invented to describe the latter. Probably it would be least inconvenient to modify the signification of the term "cell."

Analysis of animal tissue has led to similar difficulties in terminology. In the higher animals, however, the modifications which the cells undergo are so extensive that the fact that the tissues are, as in plants, resolvable into an aggregation of morphological units, could never have been established without the aid of the study of development, which proves that the animal, no less than the plant, commences its traceable existence as a simple cell, fundamentally identical with the less modified cells which are found in the tissues of the adult. Though the nucleus is almost constant among animal cells, it is not universally present; and among the lowest forms of animal life the protoplasmic mass which represents the morphological unit may be, as in the lowest plants, devoid of a nucleus. In the animal the cell-wall never has the character of a shut sac containing cellulose: and it is not a little difficult, in many cases, to say how much of the so-called cell-wall of the animal cell answers to the primordial utricle, and how much to the proper "cellulose cell-wall" of the vegetable cell. But it is certain that in the animal, as in the plant, neither cell-wall nor nucleus are essential constituents of the cell, inasmuch as bodies which are unquestionably the equivalents of cells—true morphological units—are mere masses of protoplasm, devoid alike of cell-wall and nucleus.

It results, then, for the whole living world, that the morphological unit—the primary and fundamental form of life—is only an individual mass of protoplasm, in which no further structure is discoverable; that independent living forms may present but little advance on this structure; and that all the higher forms of life are aggregates of such morphological units or cells, variously modified. All that is at present known tends to the conclusion that, in the complex aggregates of such units of which all the higher animals and plants consist, no cell has risen otherwise than by becoming separated from the protoplasm of a pre-existing cell.

2. In the course of its development, every cell proceeds from a condition in which it closely resembles every other cell, through stages of gradually increasing divergence, until it reaches the condition in which it presents the characteristic features of the elements of a special tissue. The development of the cell is, therefore, a gradual progress from the general to the special condition. The same holds good of the development of the body as a whole. However complicated one of the higher animals or plants may be, it begins its separate existence under the form of a nucleated cell, which by division becomes converted into an aggregate of similar cells; the parts of this aggregate, following different laws of growth and multiplication, give rise to the rudiments of the organs; and the parts of these rudiments again take on those modes of growth and multiplication and metamorphosis which are needful to convert the rudiment into the perfect structure. The development of the organism as a whole repeats the development of the cell. It is progress from a general to a special form, resulting from the gradual differentiation of the originally similar morphological units of which the body is composed. When the steps, of the development of two animals are compared, the number of the steps that are similar to one another will be found proportioned to the closeness of the resemblance of the adult forms; so it follows that the more closely any two animals are allied at full-

growth of structure, the later are their embryonic conditions distinguishable; a law that is alike in both plants and animals.

3. Development, then, is a process of differentiation by which the primitively similar parts of the living body become more and more unlike one another. This process of differentiation may be effected in several ways. The protoplasm of the germ may *not* undergo division and conversion into a cell aggregate; but in various parts of its outer and inner substance may be metamorphosed directly into those physically and chemically different materials which constitute the body of the adult. This occurs in such animal life as that of *infusoria*, and in such plants as the unicellular *algæ*. But the germ *may* undergo division and be converted into an aggregate of cells, which cells give rise to the tissues by undergoing a metamorphosis of the same kind as that to which the whole body is subjected in the case just mentioned. The body, formed in either of these ways, may, as a whole, undergo metamorphoses by differentiation of its parts, and the differentiation may take place without reference to any axis of symmetry, or it may have reference to such an axis. In the latter case, the parts of the body which become distinguishable may correspond on the two sides of the axis, making bilateral symmetry, or may correspond along several lines paralled with the axis, making radial symmetry. The bilateral or radial symmetry of the body may be further complicated by its segmentation, or separation by divisions, transverse to the axis, into parts, each of which corresponds with its predecessor or successor in the series. In the segmented body the segments may or may not give rise to symmetrically or unsymmetrically disposed processes, which are *appendages*, in the general sense of the word. And the highest degree of complication of structure in both animals and plants is attained by the body when it becomes divided into segments provided with appendages; when the segments not only become very different from one another, but some coalesce and lose their primitive distinctness; and when the appendages and the segments into which they are subdivided similarly become differentiated and coalesce. By such processes the flowers of some plants and the heads and limbs of some animals attain their extraordinary diversity and complication of structure. A flower-bud is a segmented body or axis, with a certain number of whorls of appendages; and the perfect flower is the result of the gradual differentiation and confluence of these primitively similar segments and their appendages. The head of an insect is, in like manner, made of segments, each with its pair of appendages, which, by differentiation and confluence, are converted into feelers and variously modified oral appendages of the adult.

In all animals which consist of cell-aggregates, the cells of which the embryo is at first composed arrange themselves by the splitting, or by a process of invagination, of the blastoderm into two layers, the *epiblast*, and the *hypoblast*, between which a third intermediate layer—the *mesoblast*—appears, and each layer gives rise to a definite group of organs in the adult. In the *vertebrata* the epiblast gives rise to the cerebro-spinal axis, and the epidermis and its derivatives; the hypoblast to the epithelium of the alimentary canal and its derivatives; and the mesoblast to all the intermediate structures. The tendency of late research is to prove that the several layers of the germ evolve analogous organs in invertebrate animals, and to indicate the possibility of tracing the several germ-layers back to the blastomeres of the yelk, from the subdivision of which they all proceed.

It may be conceived that all forms of life should have presented nearly the same differentiation of structure, and should have differed from one another by superficial characteristics, each form passing by insensible gradation into those most like it. In such case, taxonomy (the classification of morphological facts) must have been confined to forming an arrangement representing the serial gradation of these forms in nature. Or it may be conceived that living beings should have differed as widely in structure as they really do, but that the interval between any two extreme forms should have been filled up by an unbroken series of gradations; in which case classification could effect the formation of series only, the strict definition of groups being as impossible as in the former case. But, in fact, living beings differ widely, not only in structure but in the modes in which the differences are brought about; and the intervals between extreme forms are not filled up in the existing world by complete series of gradations. Hence living beings are, to a great extent, susceptible of classification into groups, the members of each group resembling one another, and differing from all the rest by definite peculiarities. No two living beings are exactly alike, but among endless diversities some constantly resemble one another so closely that it is impossible to draw a line of demarkation between them, while they differ only in such characteristics as are associated with sex. These constitute a morphological species; while different *morphological species* are defined by constant characteristics that are not merely sexual. Generic groups thus constituted may be arranged into families, orders, classes, etc.

II. Distribution.—Living beings are different in different zones of the earth and in different heights above the sea, or in different climates; and the same is true of living things in the sea. And places that differ in longitude though not differing in climate, may have different animals and plants. Certain areas are inhabited by animal or vegetable groups that are not found elsewhere. Such areas are denominated *provinces of distribution*. Such areas have no common agreements, either in extent, boundaries, or physical features. Indeed, there are no phenomena in nature more capricious and arbitrary

than the distribution of living things. The revelations of geology give us an idea of the distribution of long extinct species of animal and vegetable life, and we find that entirely different life is now found where these creatures once existed; and the further we go back the wider the differences. In any locality the succession of living forms may appear to be interrupted by numerous breaks; but the tendency of palæontological investigation is to show that these breaks are only apparent. It is evident, both with regard to animals and plants, that the changes in the living population of the earth which have taken place during its history, have been effected not by the sudden displacement of one set of living beings by another but by a process of gradual introduction of new species and the extinction of older forms. In all parts of the globe in which fossiliferous rocks have been examined, the successive terms of the series of living forms have succeeded each other in a uniform way.

III. PHYSIOLOGY.—The activities of living matter are called its functions; and those functions, though widely varied, may be arranged in three categories. They are: 1. Functions that affect the material composition of the body and determine its mass, which is the balance of the processes of waste on one hand, and those of assimilation on the other. 2. Functions which subserve the process of reproduction, which is essentially the detachment of a part endowed with the power of developing into an independent whole. 3. Functions in virtue of which one part of the body is able to exert a direct influence on another, and the body, by its parts, or as a whole, becomes a source of molecular motion. These categories are, 1, *sustentative;* 2, *generative;* 3, *correlative* functions. Of the three classes of functions the first two are invariably present in living beings. Some of the lower *fungi* do not possess the power of changing the form, or the correlative functions. In most of the lower plants, however, and in all known animals, the body either constantly or temporarily changes its form, either with or without the application of a special stimulus, and thereby changes the relations of its parts to one another, and of the whole to other bodies. The higher animals produce such changes by means of a special tissue called nerve; motion on a large scale is effected by another tissue, *muscle;* and the organism is brought into relation with surrounding things by another special tissue—that of the *sensory organs*, by means of which the forces exerted by surrounding bodies are transmuted into affections of nerve. In the lowest forms of life the functions that have been enumerated are seen in their simplest forms, and they are exerted indifferently, or nearly so, by all parts of the protoplasmic body; and the same is true of the functions of the body of even the highest organisms, so long as they are in the condition of the nucleated cell which constitutes the starting point of their development. But the first process in that development is the division of the germ into a number of morphological units or blastomeres, which eventually give rise to cells; and as each of these possesses the same physiological functions as the germ itself, it follows that each morphological unit is also a physiological unit, and the multicellular mass is strictly a compound organism made up of a multitude of physiologically independent cells. The physiological activities manifested by the complex whole represent the sum, or rather the resultant, of the separate and independent physiological activities resident in each of the simpler constituents of the whole.

The morphological changes which the cells undergo in the course of further development of the organism do not affect their individuality; and, notwithstanding the modification and confluence of its constituent cells, the adult organism, however complex, is still an aggregate of morphological units. Not less is it an aggregate of physiological units, each of which retains its fundamental independence, though that independence becomes restricted in various ways. Each cell, or that element of a tissue which proceeds from the modification of a cell, must retain its sustentative functions so long as it grows or maintains a condition of equilibrium; but the most completely metamorphosed cells show no trace of the generative function, and many exhibit no correlative functions. On the other hand, those cells of the adult organism which are the unmetamorphosed derivatives of the germ, exhibit all the primary functions, not only nourishing themselves and growing, but multiplying, and frequently showing more or less marked movements.

Organs are parts of the body which perform particular functions. Perhaps it is not strictly right to speak of organs of sustentation or generation, each of these functions being necessarily performed by the morphological unit which is nourished or reproduced. What are called the organs of these functions are the apparatuses by which certain operations subsidiary to sustentation and generation are carried on. Thus in the case of sustentative function, all those organs may be said to contribute to this function which are concerned in bringing nutriment within reach of the ultimate cells, or in removing waste matter from them; while in the case of the generative function, all those organs contribute to the functions which produce the cells from which germs are given off, or help the evacuation, or fertilization, or development of those germs. On the other hand, the correlative functions, so long as they are exerted by a simple undifferentiated morphological unit or cell, are of the simplest character, consisting of those modifications of position which can be effected by mere changes in the form or arrangement of the parts of the protoplasm, or of those prolongations of the protoplasm which are called pseudopodia or cilia. But, in the higher animals and plants, the movements of the organism and of its parts are brought about by the changes of the form of certain

tissues, the property of which is to shorten in one direction when exposed to certain stimuli. Such tissues are termed *contractile*, and, in their most fully developed condition, *muscular*. The stimulus by which this contraction is naturally brought about is a molecular change, either in the substance of the contractile tissue itself, or in some other part of the body; in which latter case the motion which is set up in that part of the body must be propagated to the contractile tissue through the intermediate substance of the body. In plants there seems to be no question that parts which retain a hardly modified cellular structure may serve as channels for the transmission of this molecular motion; whether the same is true of animals is not certain. But in all the more complex animals, a peculiar fibrous tissue (nerve) serves as the agent by which contractile tissue is affected by changes occurring elsewhere, and by which contractions thus initiated are co-ordinated and brought into harmonious combination. While the sustentative functions in the higher forms of life are still, as in the lower, fundamentally dependent upon the powers inherent in all the physiological units which make up the body, the correlative functions are, in the former, deputed to two sets of specially modified units, which constitute the muscular and nervous tissues.

When we compare the different forms of life together as physiological machines, we find that they differ as do machines of human construction. In the lower forms, the mechanism, though perfectly adapted to the work to be done, is rough, simple, and weak; while in the higher forms, it is finished, complicated, and powerful. Considered as machines, the difference between a polyp and a horse suggests that between the distaff and the spinning-jenny. In the progress from the lower to the higher organisms there is a gradual differentiation of organs and of functions. Each function is separated into many parts, which are severally intrusted to distinct organs—a sort of equitable division of physiological labor. And precisely the same process is observable in the development of any of the higher organisms; so that, physiologically as well as morphologically, development is a progress from the general to the special.

Conditions of Existence.—Thus far the physiological activities of living matter have been considered in themselves, and without reference to anything that may affect them in the world outside the living body. But living matter acts on, and is powerfully affected by, the bodies which surround it; and the study of the influence of the conditions of existence thus determined constitutes a most important part of physiology. The sustentative functions, for example, can be exerted only under certain conditions of temperature, pressure, and light, in certain media, and with supplies of particular kinds of nutritive matter; the sufficiency of which supplies is again greatly influenced by the competition of other organisms, which, striving to satisfy the same need, give rise to the *passive* "struggle for existence." The exercise of the correlative functions is influenced by similar conditions, and by direct conflict with other organisms, which constitute the *active* "struggle for existence," and, finally, the generative functions are subject to extensive modifications, dependent partly upon what are commonly called external conditions, and partly upon wholly unknown agencies. In the lowest forms of life, the only mode of generation at present known is the division of the body into two or more parts, each of which then grows to the size and assumes the form of the parent, and repeats the same process of multiplication. This method of multiplication by *fission* is properly called generation, because the parts which are separated are severally competent to give rise to individual organisms of the same nature as that from which they arose. In many of the lowest organisms the process is modified so far that, instead of the parent dividing into two equal parts, only a small portion of its substance is detached, as a bud, which develops into the likeness of the tree from which it was taken. This is generation by *gemmation*. Generation by fission and by gemmation are not confined to the simplest forms of life, however. Both modes of multiplication are common not only among plants, but among animals of considerable complexity. The multiplication of flowering plants by bulbs, that of animals by fission, and that of polyps by budding, are well-known examples of these modes of reproduction. In all the cases the bud or segment consists of a multitude of more or less metamorphosed cells. But, in other instances, a single cell detached from a mass of such undifferentiated cells contained in the parental organism is the foundation of the new organism, and it is hard to say whether such a detached cell may be more fitly called a bud or a segment—whether the process is more akin to fission or to gemmation. In all these cases the development of the new being from the detached germ takes place without the influence of other living matter. Common as the process is in plants and in the lower animals, it becomes rare among the higher animals. In these the reproduction of the whole organism from a part, in the way indicated above, ceases. At most we find that the cells at the end of an amputated portion of the organism are capable of reproducing the lost part; and, in the very highest animals, even this power vanishes in the adult; and, in most parts of the body, though the undifferentiated cells are capable of multiplication, their progeny grow, not into whole organisms like that of which they form a part, but into elements of the tissues.

Throughout almost the whole series of living beings, however, we find concurrently with the process of *agamagenesis*, or a sexual generation, another method of generation, in which the development of the germ into an organism resembling the parent depends on an influence exerted by living matter differing from the germ. This is *gamogenesis*, or

sexual generation. Looking at the facts broadly, and without reference to exceptions in detail, it may be said that there is an inverse relation between agamogenetic and gamogenetic reproduction. In the lowest organisms the latter has not yet been observed, while in the highest the former is absent. In many of the lower forms of life, agamogenesis is the common and predominant mode of reproduction, while gamogenesis is exceptional; on the contrary, in many of the higher, while gamogenesis is the rule, agamogenesis is an occasional exception. In the simplest condition, that termed *conjugation*, sexual generation consists in the coalescence of two similar masses of protoplasmic matter, derived from different parts of the same organisms of the same species, and the single mass which results from the fusion develops into a new organism. In the majority of cases, however, there is a marked morphological difference between the two factors in the process, and then one is called the male, and the other the female element. The female element is relatively large, and undergoes but little change of form. In all the higher plants and animals, it is a nucleated cell, to which a greater or less amount of nutritive material, constituting the food-yelk, may be added. The male element, on the other hand, is relatively small. It may be conveyed to the female element by an outer growth of the wall of its cell, which is short in many *algæ* and *fungi*, but becomes an immensely elongated tubular filament in the case of the pollen cell of flowering plants. But more commonly the protoplasm of the male cell becomes converted into rods or filaments, which usually are in active vibratory movement, and sometimes are propelled by numerous cilia. Occasionally they are devoid of mobility, as in many *arthropoda* and *nematoidea*. The manner in which the contents of the pollen tube affect the embryo cell in flowering plants is unknown, as no perforations through which the contents of the pollen tube may pass so as actually to mix with the substance of the embryo cell have been discerned; and there is the same difficulty with respect to the conjugative processes of some of the *cryptogamia*. But in the great majority of plants, and in all animals, there can be no doubt that the substance of the male element actually mixes with that of the female, so that in all these cases the sexual process remains one of conjugation; and impregnation is the physical admixture of protoplasmic matter derived from two sources, which may be different parts either of the same organism, or of different organisms.

The effect of impregnation appears in all cases to be that the impregnated protoplasm tends to divide into portions (*blastomeres*), which may remain united as a single cell-aggregate, or some or all of them may become separate organisms. A longer or shorter period of rest, in many cases, intervenes between the act of impregnation and the commencement of the process of division. As a general rule, the female cell which directly receives the influence of the male, is that which undergoes division and eventual development into independent germs; but there are some plants, such as the *floridæ*, in which this is not the case. In these the protoplasmic body of the trichogyne, which unites with the molecular spermatozoids, does not undergo division itself, but transmits some influence to adjacent cells, in virtue of which they become subdivided into independent germs or spores. There is still much obscurity respecting the reproductive processes of the *infusoria;* but, in the *vorticellidæ*, it would appear that conjugation merely determines a condition of the whole organism, which gives rise to the division of the endoblast, or so-called nucleus, by which germs are thrown off; and if this be the case the process would have some analogy to what takes place in the *floridæ*. On the other hand, the process of conjugation by which two distinct *diporpæ* combine into that extraordinary double organism, the *diplozoon paradoxum*, does not directly give rise to germs, but determines the development of the sexual organs in each of the conjugated individuals; and the same process takes place in a large number of the *infusoria*, if what are supposed to be male sexual elements in them are really such. The process of impregnation in the *floridæ* is remarkably interesting from its bearing upon the changes which fecundation is known to produce upon parts of the parental organism other than the ovum, even in the highest animals and plants.

The nature of the influence exerted by the male upon the female element is unknown. No morphological distinction can be drawn between those cells which are capable of reproducing the whole organism without impregnation, and those which need it, as is obvious from what happens in insects, where eggs which ordinarily require impregnation —exceptionally, as in many moths, or regularly, as in the case of drones among bees— develop without impregnation. In fact, generation may be regarded as a particular case of cell multiplication, and impregnation simply as one of the many conditions which may determine or affect that process. In the lowest organisms, the simple protoplasmic mass divides, and each part retains all the physiological properties of the whole, and consequently constitutes a germ whence the whole body can be reproduced. In more advanced organisms each of the multitude of cells into which the embryo cell is converted at first, probably retains all, or nearly all, the physiological capabilities of the whole, and is capable of serving as a reproductive germ; but as division goes on, and many of the cells which result from division acquire special morphological and physiological properties, it seems not improbable that they, in proportion, lose their more general characteristics. In proportion, for example, as the tendency of a given cell to become a muscle cell or a cartilage cell is more marked and definite, it is readily conceivable that its primitive capacity to reproduce the whole organism should be

reduced; though it might not be altogether abolished. If this view is well based, the power of reproducing the whole organism would be limited to those cells which had acquired no special tendencies, and consequently had retained all the powers of the primitive cell in which the organism commenced its existence. The more extensively diffused such cells were, the more generally might multiplication by budding or fission take place; the more localized, the more limited would be the parts of the organism in which such a process would take place, and even where such cells occurred, their development or non-development might be connected with the conditions of nutrition. It depends on the nutriment supplied to the female larva of a bee whether it shall become a neuter or a sexually perfect female; the sexual perfection of a large proportion of the internal parasites is similarly dependent on their food; and perhaps on other conditions, such as the temperature of the medium in which they live. Thus the gradual disappearance of agamogenesis in the higher animals would be related with that increasing specialization of function which is their essential characteristic; and when it quite ceases to occur, it may be supposed that no cells are left which retain unmodified the powers of the primitive embryo cell. The organism is then like a society in which every one is so engrossed by his special business that he has neither time nor inclination to marry. Even the female elements in the highest organisms, little as they differ to all appearance from undifferentiated cells, and though they are directly derived from epithelial cells which have undergone very little modification from the condition of blastomeres, are incapable of full development unless they are subjected to the influence of the male element, which may be compared to a kind of nutriment. But it is a living nutriment, in some respects comparable to that which would be supplied to an animal kept alive by transfusion, and its molecules may transfer to the impregnated embryo cell any special characters of the organism to which it belongs.

The tendency of the germ to reproduce the characteristics of its immediate parents, combined in the case of sexual generation with the tendency to reproduce the characteristic of the male, is the source of the singular phenomena of *hereditary transmission*. No structural modification is so slight, no functional peculiarity is so insignificant, in either parent, that it may not make its appearance in the offspring. But the transmission of parental peculiarities depends greatly upon the manner in which they have been acquired. Such as have arisen naturally, and have been hereditary through many generations, tend to appear in the progeny with great force; while artificial modifications, such, for example, as result from mutilation, are rarely, if ever, transmitted. Circumcision through innumerable ancestral generations does not appear to have reduced that rite to a mere formality, as it should have done if the abbreviated prepuce had become hereditary in the Jewish people; while modern lambs are born with long tails, notwithstanding the long-continued practice of cutting those of every generation short. And it remains to be seen whether the supposed hereditary transmission of the habit of retrieving among dogs is really what at first it seems to be. On the other side, Brown-Sequard's case of the transmission of artificially induced epilepsy in guinea-pigs is undoubtedly very weighty. In many plants and animals which multiply both asexually and sexually, there is no definite relation between the agamogenetic and the gamogenetic phenomena. The organism may multiply asexually before, or after, or concurrent with the act of sexual generation. But in a great many of the lower organisms, whether animal or vegetable, the organism which results from the impregnated germ produces offspring only agamogenetically. This is *alternation of generations*, which is, strictly, an alternation of asexual with sexual generation, in which the products of the one process differ from those of the other. The hydrozoa offer a complete series of gradations between a free self-nourishing organism, through those in which it is free but unable to feed itself, to those in which the sexual elements are developed in bodies which resemble free zoöids, but are never detached, and are mere generative organs of the body on which they are developed.

In the last case, the *individual* is the total product of the development of the impregnated embryo, all the parts of which remain in material continuity with one another. The multiplication of mouths and stomachs in a *cordylophora* no more makes it an aggregation of different individuals than the multiplication of segments and legs in a centipede converts that *arthopod* into a compound animal. The *cordylophora* is a differentiation of a whole into many parts, and the use of any terminology which implies that it results from the coalescence of many parts into a whole is to be deprecated. In *cordylophora*, the generative organs are incapable of maintaining a separate existence; but in nearly all allied *hydrozoa* the unquestionable homologues of these organs become free zoöids, in many cases capable of feeding and growing, and developing sexual elements only after they have undergone considerable changes of form. Morphologically, the swarm of *medusæ* thus set free from a hydrozoon are as much organs of the latter as the multitudinous pinnules of a *comatula*, with their genital glands, are organs of the echinoderm. Morphologically, therefore, the equivalent of the individual *comatula* is the hydrozoic stock *plus* all the medusæ which proceeds from it. No doubt it sounds paradoxical to speak of a million of *aphides*, as parts of one morphological individual; but beyond the momentary shock of the paradox, no harm is done.

IV. Ætiology has for its object the ascertaining of the causes of the facts developed under the preceding heads of morphology, distribution, and physiology, by showing

that they constitute particular cases of general physical laws. It is well to say that etiology is yet in its infancy, and that no extended dissertation touching the origin of the species is here undertaken. We can only indicate the general nature of the problems to be involved, and the course of inquiry that may lead to their solution. The first question is: Have we any knowledge, and, if so, what knowledge, of the origin of living matter? Down almost to our times, the universal assumption was that living beings were produced by generation from previous living beings of the same kind; but about 200 years ago investigators began to suspect that this rule was not universally applicable, but that small and obscure organisms were produced by the fermentation of dead putrefying, certainly non-living matter, by a process which they called *spontanea* or *generatio æquivoca*, now known as *abiogenesis*. After the investigations of Redi, Spallanzi, and others, people began to doubt the applicability of the axiom "all life comes from the living" to the more complex organisms which constitute the present fauna and flora. The most ardent supporters of abiogenesis at the present time do not pretend that organisms of higher rank than the lowest *fungi* and *protozoa* are produced otherwise than by generation from pre-existing organisms. It is, however, alleged that *bacteria*, *torulæ*, and certain *fungi*, and monads are developed under conditions which render it impossible that these organisms should have proceeded directly from living matter. The experimental evidence adduced in favor of this proposition is always of one kind, and the reasoning on which the conclusion that abiogenesis occurs is based may be thus stated: 1. All living matter is killed when heated to certain degrees. 2. The contents of a certain closed vessel have been heated to such degrees. 3. Therefore, all living matter which may have been therein has been killed. *But*, living *bacteria* have appeared in such contents subsequently to their being heated; *therefore*, they have been formed abiogenetically—that is, a living being has come from non-living matter. This is perfect logic; but then its validity depends upon the absolute accuracy of the first and second propositions. Suppose we have a fluid full of active *bacteria;* what evidence have we that they are killed by the heat? Only one kind of evidence can be conclusive, and that is that the fluid has been carefully protected from outward contact, and that *bacteria* have never appeared since the heating. The other testimony, for example that which may be furnished by the cessation of motion in the *bacteria*, and such changes as microscopes allow us to observe, is merely presumptive evidence of death, but no more conclusive of death than are insensibility and paleness in a man who has swooned. But though some living beings are killed with moderate heat, and some bear a very high degree without dying, there is no ground for the assumption that *all* living matter is killed at some given temperature. There is, further, good reason for believing that the influence of temperature on life is greatly modified; first, by the nature of the medium in which the organisms to be tested are placed, and, secondly, by the length of time during which they are subjected to trial. The latest experiments leave the question as far as ever from settlement; hence it is reasoned that no experimental evidence that a liquor may be heated to certain degrees and yet subsequently give rise to living organisms, is of the least value as proof that abiogenesis has taken place; and this for two reasons: 1. There is no proof that organisms of the kind in question are dead, except their incapacity to grow and reproduce their kind. 2. Since we know that conditions may largely modify the power of resistance of such organisms to heat, it is far more probable that such conditions existed in the experiment in question than that the organisms were generated anew out of dead matter. Prof. Huxley considers not only that the kind of evidence adduced in favor of abiogenesis is logically insufficient to furnish proof of its occurrence, but also that it may be stated as a well-based induction that the more careful the investigator, and the more complete his mastery over the endless practical difficulties which surround experimentations on this subject, the more certain are his experiments to give a negative result, while the positive results are no less sure to crown the efforts of the clumsy and the careless.

A belief in abiogenesis, it is argued, is a necessary corollary from the doctrine of *evolution*. This, says Huxley, may be true of the occurrence of abiogenesis at some time; but if the present day, or any recorded epoch of geological time, be a question, the exact contrary holds good. If all living beings have been evolved from pre-existing forms of life, it is enough that a single particle of living protoplasm should once have appeared on the globe, as the result of whatever agency. In the eyes of a consistent evolutionist any further independent formation of protoplasm would be sheer waste. The production of living matter since the time of its first appearance, only by way of biogenesis, implies that the specific forms of the lower kinds of life have undergone but little change in the course of geological time, and this is said to be inconsistent with the doctrine of evolution. But, in the first place, the fact is not inconsistent with the doctrine of evolution properly understood, that doctrine being perfectly consistent with either the progression, the retrogression, or the stationary condition of any particular species for indefinite periods of time; and, secondly, if it were, it would be so much the worse for the doctrine of evolution, inasmuch as it is unquestionably true that certain even highly organized forms of life have persisted without any sensible change for very long periods. The fact is, says Huxley, that at the present moment there is not a shadow of trustworthy direct evidence that abiogenesis does take place within the period during which the existence of life on the globe is recorded. But it need hardly be pointed out that this

fact does not in the slightest degree interfere with any conclusion that may be arrived at deductively from other considerations that, at some time or other, abiogenesis must have taken place. If the hypothesis of evolution be true, living matter must have arisen from, or, at least, in place of non-living matter; for by the hypothesis, the condition of the globe was at one time such that living matter could not have existed in it, life being entirely incompatible with the gaseous state. But living matter once originated, there is no necessity for other origination, since the hypothesis postulates the unlimited, though perhaps not illimitable, modifiability of such matter.

Of the causes which have led to the origination of living matter, or the *origin of the species*, it may be said (continues Huxley) that we know absolutely nothing. But, postulating the existence of living matter endowed with that power of hereditary transmission and that tendency to vary which is found in all such matter, Mr. Darwin has declared that the interaction between living matter and surrounding conditions, which results in the survival of the fittest, is sufficient to account for the gradual evolution of plants and animals from their simplest to their most complicated forms, and for the known phenomena of morphology, physiology, and distribution. While much weight is to be conceded to the evidences for the conceivable sufficiency of the above interaction for the alleged results, its actual efficiency in the history of the case must be regarded as at present only a hypothesis.

If all living beings have come into existence by the gradual modification, through a long series of generations, of a primordial living matter, the phenomena of embryonic development ought to be explicable as particular cases of the general law of hereditary transmission. On this view, a tadpole is first a fish and then a tailed amphibian, provided with both gills and lungs, before it becomes a frog, because the frog was the last term in a series of modifications whereby some ancient fish became an urodele amphibian, and the urodele amphibian became an anurous amphibian. In fact, the development of the embryo is a recapitulation of the ancestral history of the species. If this be so, it follows that the development of any organism should furnish the key to its ancestral history; and the attempt to decipher the full pedigree of organisms from so much of the family history as is recorded in their development has given rise to a special branch of biological speculation termed *phylogeny*. In practice, however, the reconstruction of the pedigree of a group from the developmental history of its existing members is fraught with difficulties. It is highly probable that the series of developmental stages of the individual organism never presents more than an abbreviated and condensed summary of ancestral conditions; while this summary is often strangely modified by variation and adaptation to conditions; and it must be confessed that in most cases we can do little better than guess at what is genuine recapitulation of ancestral forms, and what is the effect of comparatively late adaptation. The only perfectly safe foundation for the doctrine of *evolution* (concludes Huxley) lies in the historical or, rather, archæological evidence that particular organisms have arisen by the gradual modification of their predecessors, which is furnished by fossil remains. That evidence is daily increasing in amount and in weight; and it is to be hoped that the comparison of the actual pedigree of these organisms with the phenomena of their development may furnish some criterion by which the validity of phylogenetic conclusions, deduced from the facts of embryology alone, may be satisfactorily tested. According to this statement of the case by Huxley, it would follow that the doctrine of evolution is, for the present, to be held in expectancy; and that it is possible to use concerning it terms of too positive assertion.

BION, a Greek poet, about 280 B.C., who migrated to Italy and died from poison. Some love verses and some fragments of pastorals in hexameters by him are extant.

BIOPLASMIC THEORY. See GERM-THEORY OF DISEASE.

BIORNEBORG, a seaport t. of Finland, on the gulf of Bothnia, at the mouth of the Kumo, 76 m. n.n.w. from Abo. Pop. '67, 7270. Ship-building is carried on. Timber, pitch, and tar are the principal exports.

BIOT, EDUARD CONSTANT, son of Jean Baptiste, a distinguished Chinese scholar, was b. at Paris, 2d July, 1803. He was one of the first to promote the introduction of railways in France; but his health failing, he retired from the public service, and devoted his leisure to the study of Chinese, and the history of the social organization of the Celestial empire. He died Mar., 1850. He wrote a *Dictionnaire des Villes, etc., de l'Empire Chinois* (1842), and a multitude of *Mémoires* on Chinese subjects of scientific and social interest, printed in the *Journal Asiatique*, etc. His interesting work, *De l'Abolition de l'Esclavage Ancienne en Occident* (1840), was awarded a gold medal by the institute.

BIOT, JEAN BAPTISTE, a distinguished French physicist and astronomer, was b. at Paris, 21st April, 1774. He at first entered the artillery, but forsook the service for science; and in 1800 became professor of physics in the college de France. He was made a member of the institute in 1803; and in 1804, it was solely through him that the institute voted against making Napoleon emperor. Along with Arago, he was made a member of the bureau of longitude, and (1806) sent to Spain to carry out the measuring of a degree of the meridian, preparatory to the introduction of the present French system of weights and measures. On his return, he devoted himself to physical researches and to lecturing. In 1815, the royal society of London elected him one of their 50 foreign

members. In 1817, he visited England, and went as far n. as the Shetland islands, in order to make observations along the line of the English arc of meridian, which had been extended by col. Mudge. His most valuable contributions to science are on the polarization of light; and his researches connected with ancient astronomy are also very valuable. Of his numerous writings may be mentioned *Traité Elémentaire d'Astronomie Physique*, 3 vols. (Paris, 1805); 3d ed., considerably augmented (1850), 6 vols., with vol. of plates—translated into English. *Traité de Physique*, 4 vols. (1816); *Précise de Physique*, an abridgment of the former in 2 vols. (1817), often republished: *Recueil d'Observations Géodésiques*, etc. (1821). B. also contributed many excellent biographies of scientific men to the *Biographie Universelle*. Among the most important of his later works are *Recherches sur l'ancienne Astronomie Chinoise* (1840); *Mémoire sur la Constitution de l'Atmosphere Terrestre*, in the *Connaissance des Temps* (1841); and *Etudes sur l'Astronomie Indienne* (1862). In 1849, B. was made a commander of the legion of honor, and he was also a member of most of the learned societies in Europe. He died Feb. 3, 1862.

BIPED (Lat.), *two-footed*, a term sometimes applied, as descriptive, to man, more frequently to birds, and which scarcely admits of application to any other animal except a very few species of reptiles, some of which are batrachian (see BATRACHIA and SIREN), and some saurians (see SAURIA). The two-footed saurians may be regarded as forming a link between that order and serpents, the two-footed batrachians as connecting batrachians with fishes, other characters of resemblance being in both instances associated with this.

BIPEN'NIS, a double-headed axe, the weapon which, according to ancient historians and artists, particularly distinguished those fabulous female warriors, the Amazons.

BIPONT EDITIONS, copies of the classics issued in Deux-Ponts, or Zweibrucken, in the palatinate of the Rhine, begun in 1779, and finished (in 50 vols.) at Strassburg.

BIQUADRATIC. See EQUATIONS.

BIR (ancient *Birtha*, Turkish *Bireh-jik*), a t. of from 1800 to 2000 houses of Asiatic Turkey, in the pashalic of Diarbekir. It is situated on the e. bank of the Euphrates, in lat. 37° 3′ n., long. 38° e., on a steep hill above the river, the passage of which is here commanded by a castle. B. is surrounded by a strong wall flanked with towers; its streets are narrow, but clean; it has several mosques with tall minarets, a caravansary, a bazaar, and a ruined citadel and castle. Travelers and caravans from Aleppo to Diarbekir, Bagdad, Persia, etc., cross the Euphrates at this point. From B., col. Chesney proposed to navigate the Euphrates by small steamers to its mouth in the Persian gulf, a distance of 1143 miles. B., which signifies "well," is the prefix of several other smaller towns in Arabia.

BIRCH (*bétula*), a genus of plants of the natural order *amentaceæ* (q.v.), sub-order *betulineæ*, the natural order *betulaceæ* of some botanists. In this order or sub-order—which contains only the two genera, birch and alder (q.v.)—the flowers have merely small scales for their perianth; the ovary is two-celled, but the fruit—a small achenium (q.v.)—is by abortion one-celled; the fruits and scales united form a sort of cone; and the leaves have stipules which soon fall off. They are all trees or shrubs, natives of temperate and cold regions.—The genus *betula* is distinguished by 10 to 12 stamens, and winged achenia.—The common B. (*betula alba*) has small ovato-triangular doubly serrated leaves. It is a very beautiful forest-tree, abounding in the n. of Europe and of Asia, often forming large groves by itself. In the s. of Europe, it is found only upon mountains of considerable elevation. It is a tree of rapid growth. In favorable situations, it attains the height of 60 or even 70 ft., with a diameter of 1½ or 2 ft.; whilst on the northern, or utmost alpine limits of vegetation, it only appears as a stunted bush. The bark is smooth and silvery white, and its outermost layers are thrown off as the tree advances in age. The smaller branches are very slender and flexible, and in a particularly graceful variety called the weeping B. (*B. pendula* of some botanists), they are still more slender, elongated, and pendulous. Some of the finest weeping birches in Britain stand on the banks of the river Findhorn, near Forres, in Morayshire; they are 60 ft. high, and exhibit pendent masses of spray 10 ft. in length. The bark and leaves of the B. are, in some northern countries, used medicinally in cases of fever and eruptions. They are also used for dyeing yellow. The bark is sometimes used for tanning, and is preferred to every other kind of bark for steeping nets, sails, and cordage. See BARK FOR TANNING. It is in some countries made into shoes, hats, drinking-cups, etc., and it is even twisted into a coarse kind of ropes. Portable boats made of it are used on the Volga. It is remarkable for durability. In many parts of the n. of Europe, it is used instead of slates or shingles by the peasantry; and in Russia—the outer or white layers being subjected to distillation—there is obtained a reddish empyreumatic oil called B. oil; it yields also the B. tar, or *degutt*, which is employed in the preparation of Russia leather. Dried, ground, and mixed with meal, B. bark is used in Norway for feeding swine; and, in times of scarcity, has even served for human food. The wood is in universal use in northern countries for the most various purposes. It is white, firm, and tough, and is employed by wheelwrights, coopers, turners, etc. It is very much employed in the manufacture of barrels for fish. It is much employed for smoking hams, herrings, etc., because of the flavor which it imparts. Much of it is made into

charcoal for forges. The twigs are in general use for besoms. In the highlands of Scotland, and in many other countries, the sap is not only used as a beverage in a fresh state, but is converted by fermentation into a kind of wine. To obtain it, a hole is bored in the stem, in spring, in an oblique direction, one or two inches deep, and a small tube is introduced to carry the sap into a vessel. From a strong stem, there often flows as much as from four to six quarts in a day. If the hole is again closed up each time with a wooden plug, covered over with clay or resin, and the tapping is annually renewed in the same place, the tree sustains very little injury. B. sap is very beneficial in diseases of the kidneys and in cases of urinary calculus. It contains more than 2 per cent of sugar.—The white B. of North America (*B. populifolia*) very nearly resembles the common B., but is of much less value. It is found as far s. as Pennsylvania. The wood is scarcely used.—The black B. of the same country (*B. nigra*), also sometimes called red B., and very similar to the common B., produces very hard and valuable timber. It attains the height of 70 feet. It is not found further n. than New Jersey. The bark is of a dark color, the epidermis in the younger trees reddish.—But the name black B. is also given to another species found in the more northern parts of North America, and sometimes called the sweet B. or cherry B. (*B. lenta*), also a tree of 70 ft. or upwards in height, and of which the timber is fine-grained, and valuable for making furniture, and for other purposes. Its leaves, when bruised, diffuse a sweet odor, and, when carefully dried, make an agreeable tea. It is remarkable that this tree has been little planted in Britain.—The yellow B. of North America (*B. excelsa*) is a tree of 70 to 80 ft. high, destitute of branches for 30 to 40 ft., remarkable for its large leaves, which are 3½ in. long, and for the brilliant golden yellow color of the epidermis. It is found in Nova Scotia, New Brunswick, Maine, etc. Its timber is used in ship-building. The young saplings of all these American species are much employed for making hoops for casks.—The paper B. (*B. papyracea*) is found in the northern parts of North America. It attains the height of 70 feet. The bark of the young trees is of a brilliant whiteness. The bark is capable of division into very thin sheets, which have been used as a substitute for paper. It is used by the Indians for canoes, boxes, buckets, baskets, etc. Large plates of it are curiously stitched together with the fibrous roots of the white spruce, and coated with the resin of the balm of Gilead fir. The wood is used for the same purposes with that of the common B.—The mountainous districts of India produce several species of this genus. Thin, delicate plants of the bark of *B. bhojputtra*, a native of the mountains of Kumaon, are used for lining the tubes of hookahs, and are carried in great quantities to the plains of India for this purpose. They were formerly used instead of paper for writing. *B. acuminata*, a native of the mountains of Nepaul, is a tree 50 to 60 ft. high, covered with branches from the base, and of an oval form. Its wood is strong and durable.—The dwarf B. (*B. nana*) is a mere bushy shrub, seldom more than 2 or 3 ft. high, and generally much less. It has orbicular crenate leaves. It is a native of the whole of the most northern regions of the globe, and is found in some parts of the highlands of Scotland. It is interesting because of its uses to the Laplanders and other inhabitants of very northern regions, to whom it supplies their chief fuel, and the material with which they stuff their beds. Its seeds are the food of the ptarmigan, on which the Laplanders in a considerable degree depend. A similar shrubby species (*B. antarctica*) occurs in Terra del Fuego.

BIRCH, SAMUEL, keeper of the oriental antiquities in the British museum, is a son of the late Rev. S. Birch, rector of St. Mary Woolnoth, in the city of London, and was born in London, in the year 1813. B. was educated at Merchant Taylors' school. In 1834, he entered the public service under the commissioners of public records; and in 1836, he obtained the appointment of assistant in the department of antiquities, British museum. In this capacity, B. acquired an extensive acquaintance with archæology in all its branches. He studied not only Greek and Roman antiquities, including numismatics, but applied himself with untiring zeal to Egyptian hieroglyphics. In process of time, he so distinguished himself in this difficult branch of learning, that he gained the notice of the celebrated chevalier Bunsen, who gladly availed himself of B.'s knowledge in the philological portion of *Egypt's Place in Universal History*. The chevalier, in his preface, thankfully acknowledged this assistance in the following terms: "This English edition owes many valuable remarks and additions to my learned friend, Mr. Samuel Birch, particularly in the grammatical, lexicographic, and mythological part. That I have been able to make out of the collection of Egyptian roots, printed in the German edition, a complete hieroglyphical dictionary, is owing to him. To him also belong the references to the monumental evidence for the signification of an Egyptian word, wherever the proof exhibited in Champollion's dictionary or grammar is not clear or satisfactory. . . . The work may now be said to contain the only complete Egyptian grammar and dictionary, as well as the only existing collection and interpretation of all the heiroglyphical signs; in short, all that a general scholar wants, to make himself master of the hieroglyphic system, by studying the monuments." After Bunsen's decease, B. was engaged to prepare for the press and edit the fifth and concluding volume of *Egypt's Place*, a task which he has performed in an admirable manner, giving the results of all the discoveries made by Egyptologists, since the publication of the first volume, in 1848, down to the year 1867. B. has also prepared a second edition of the first volume of *Egypt's Place*,

published at the same time as vol. 5, and in which the same care has been taken to make the work correspond with the most recent investigations of hieroglyphic scholars. It was by the particular desire of Bunsen, as expressed on his death-bed, that B. undertook the revision of his work on Egypt. B. is now universally recognized as the foremost Egyptologist in this country. In 1844, upon the retirement of Mr. Barnewell from the office of assistant-keeper in the department of antiquities, B. was appointed his successor. In 1861, upon the retirement of Mr. Hawkins from the post of keeper of the antiquities, that department was divided into three separate and independent departments, viz., the department of oriental, mediæval, and British antiquities, and ethnography; the department of Greek and Roman antiquities; and the department of coins and medals. B. was appointed keeper of the first-named collections; but afterwards, a fourth department was constituted out of these collections, viz., that of British and mediæval antiquities and ethnography, so that B. is now the keeper only of the Egyptian and oriental antiquities. In 1862, B. received the honorary degree of LL.D. from the university of St. Andrews and from Cambridge in 1874, in which year B. was president of the great London congress of orientalists. He is a corresponding member of the institute of France (académie des inscriptions et des belles-lettres); also of the academy of Berlin, of the academy of Herculaneum, and of the archæological institute of Rome. B.'s principal publications are as follow: *Gallery of Antiquities selected from the British Museum by F. Arundale and J. Bonomi, with Descriptions by S. Birch* (1842); *Views on the Nile, from Cairo to the Second Cataract, drawn on Stone, from Sketches taken by Owen Jones and J. Goury, with Historical Notices of the Monuments by S. Birch* (1843); *Catalogue of Greek and Etruscan Vases in the British Museum* (1851), drawn up in conjunction with Mr. Newton; *An Introduction to the Study of the Egyptian Hieroglyphs*, for Gardner Wilkinson's *Egyptians* (1857), and a new edition of Wilkinson's work (1879); *History of Ancient Pottery* (2 vols., 1858); *Description of the Papyrus of Nas-khem, Priest of Amen-ra, discovered in an Excavation made by direction of H.R.H. the Prince of Wales in a Tomb near Gournah at Thebes* (1863); and the *Rhind Papyri* (1866). Besides his Egyptian and classical labors, B. has also studied Chinese, and in that direction is author of the following brief contributions, viz., *Analecta Sinensia*, short stories from the Chinese (1841); *The Friends till Death*, a tale translated from the Chinese (1845); and *Chinese Romance—The Elfin Foxes* (1863). B. has likewise contributed papers to the *Archæologia*, to the *Transactions of the Royal Society of Literature*, the *Revue Archéologique*, the *Archäologische Zeitung*, and the *Zeitschrift für Aegyptische Sprache und Alterthumskunde*. He has also written many articles for the *English Encyclopædia*, principally on subjects connected with Egyptian antiquities and hieroglyphics. In the same class of subjects, he has been a much valued contributor to Chambers's *Encyclopædia*.

BIRCH, THOMAS, D.D., an industrious historical writer, son of a coffee-mill maker, a Quaker, b. at Clerkenwell, Nov. 23, 1705, was at first an usher in different schools. Having taking priests' orders in 1731, he was presented in 1732 to a living in Essex, and in 1734 became chaplain to the earl of Kilmarnock, who was beheaded in 1746. Appointed in the latter year rector of St. Margaret Pattens with St. Gabriel, Fenchurch street, London, B. was elected in 1752 one of the secretaries of the royal society, a history of which he published in 4 vols. 4to, in 1756–57. In 1761, he was preferred to the rectory of Deepdene, Surrey. His first literary undertaking, in which he was assisted by others, was *The General Dictionary, Historical and Critical*, 10 vols., 1734–41, founded on Bayle's celebrated work. He next edited the collection of state papers of Thurloe, secretary to Oliver Cromwell, 7 vols. folio, 1742. His other works are *Life of the Hon. Robert Boyle*, 1744; *Lives and Characters of the Illustrious Persons of Great Britain*, the engravings by Houbraken, Gravelot, and Vertue (London, 1743–52); *Inquiry into the Share which King Charles I. had in the Transactions of the Earl of Glamorgan*, 1747; *Historical View of the Negotiations between the Courts of England, France, and Brussels*, 1592 to 1617, 1749; *Life of Tillotson*, 1752; *Memoirs of the Reign of Queen Elizabeth*, 2 vols. 1754; *Life of Henry, Prince of Wales*, 1760; etc. He likewise edited the works of sir Walter Raleigh, Bacon's works, and various others. He was killed by a fall from his horse in the Hampstead road, 9th Jan., 1766. He left an extensive MS. collection, with his library, to the British museum, of which he was a trustee. From these MSS. were compiled *The Courts and Times of James I. and Charles I.*, 4 vols. 8vo (London, 1848).

BIRCH-PFEIFFER, CHARLOTTE, a German actress and writer of plays, was b. at Stuttgart in the year 1800. Her passion for the stage displayed itself so strongly, that after encountering much opposition on the part of her parents, she made her début at Munich at the age of 13, and afterwards played with great success at Berlin, Vienna, and Hamburg. In 1825, she married Dr. Christian Birch of Copenhagen, and afterwards performed at Petersburg, Pesth, Amsterdam, and other places. In 1837, she undertook the direction of the theatre at Zurich. At a later period, she acquired even greater renown as a writer for the stage than as an actress. Her principal theatrical pieces are *Pfefferrösel; Hinko; Die Günstlinge*, perhaps her best piece; *Der Glöckner von Notre Dame;* etc. In 1843, Madame B. resigned the direction of the Zurich theatre, and after visiting professionally most of the cities in Germany, made an engagement with the theater-royal at Berlin. The chief productions of what may be termed her later manner are—*Die Marquise von Villette* (1845), *Dorf und Stadt* (1848), *Eine Familie* (1849), *Anna von Oestrich*

(1850), *Ein Billet* (1851). In 1862 was published a complete edition of her dramatic works, which are about 70 in number, and a collection of her novels and tales. She died at Berlin, Aug. 25, 1868.

BIRD, EDWARD, an English *genre* painter of considerable celebrity, was b. at Wolverhampton in 1772. He having early displayed a strong inclination for drawing his father thought he was consulting his son's taste when he apprenticed him to a Birmingham tea-board manufacturer, his duty there being to paint flowers, shepherds, etc., on the boards. On the expiration of his apprenticeship, B. established himself as a drawing-master in Bristol; and two of his pictures, the "Choristers Rehearsing," and "The Will," having been bought by the duke of Clarence, afterwards William IV., and the marquis of Hastings, his reputation was secure. He was elected a royal academician, and soon obtained some good commissions. The "Field of Chevy Chase the Day after the Battle," is generally considered his masterpiece. His "Death of Eli" obtained the British institution prize of 300 guineas. In 1813, B. was appointed painter to the princess Charlotte. He now became ambitious to excel in Scripture subjects, and painted several, none of which, however, added to his fame. His last picture, the "Embarkation of Louis XVIII. for France," which was never finished, was the least satisfactory of all his works. He died in 1819. His most popular works are—"The Blacksmith's Shop," "The Country Auction," "The Village Politicians," "The Young Recruit," etc.

BIRD, FREDERICK MAYER, b. 1838; son of Robert; graduated at the university of Pennsylvania; minister in the Lutheran church, which he left in 1868 to join the Protestant Episcopal; taking charge of a church in New Jersey. He has paid great attention to hymnology, and edited in whole or in part the *Lutheran Hymn Book* and *Hymns of the Spirit*.

BIRD, GOLDING, 1815–54; an English physician proficient in botany; lecturer on natural philosophy and materia medica in Guy's hospital. He was author of *Elements of Natural Philosophy, being an Experimental Introduction to the Physical Sciences, Lectures on Electricity and Galvanism in their Physiological and Therapeutical Relations*, and some other works.

BIRD, ROBERT MONTGOMERY, 1803–54; b. in Delaware; practiced medicine in Philadelphia, and wrote for magazines. He wrote *The Gladiator* for Edwin Forrest, and afterwards wrote several historical romances. In his *Peter Pilgrim*, there is a careful description of the Kentucky mammoth cave. He was also for a time editor of the *North American*.

BIRD-BOLT. Stevens, in his note on *Much Ado about Nothing*, says the B. is "a short, thick arrow, without point, spreading at the extremity so much as to leave a broad flat surface, about the breadth of a shilling. Such are to this day in use to kill rooks with, and are shot from a cross-bow."

BIRD-CATCHING SPIDER, a name originally given to a large spider, *mygale avicularia*, a native of Cayenne and Surinam; but which is now more extensively applied, being equally appropriate to a number of large species of *mygale* (q.v.) and *epeira* (q.v.), perhaps also of other genera. It has indeed been denied by some observers that the name is truly appropriate, but the positive evidence is too strong to be easily set aside by evidence merely negative. The *mygale avicularia* is nearly two inches long, very hairy, and almost entirely black; its feet, when stretched out, occupy a surface of nearly a foot in diameter. The hooks of its mandibles are strong, conical, and very black. This great spider forms a tube-shaped cell, widening towards the mouth, of a fine white semi-transparent tissue, like muslin, in clefts of trees or hollows among rocks and stones. From this it issues only at night, to prey upon insects, and, it is said, upon hummingbirds. It does not construct a net for the capture of its prey, but takes it by hunting, as do other large species of *mygale*, natives of the warm parts of America, the East Indies, and Africa. It is probably a species of this genus that Dampier mentions as found in Campeachy, the fangs of which, "black as jet, smooth as glass, and, at their small end, as sharp as a thorn," are said by him to be worn by some persons in their tobacco-pouches, to pick their pipes with; and to be by others used as toothpicks, in the belief of their having power to expel the toothache. The bite of the large species of this genus is said to be dangerous.

It appears that spiders of the genus *epeira* feed upon small birds caught in their webs, which have even been described as in some cases large enough to arrest the flight of a bird the size of a thrush, and to impede the traveler in tropical forests.

BIRD-CHERRY, *Padus*, a subdivision of the genus *cerasus* (see CHERRY), itself very generally regarded as a sub-genus of *prunus* (see PLUM). The bird-cherries are distinguished by racemes of small flowers and deciduous leaves.—The COMMON B. (*prunus* or *cerasus padus*), called in Scotland *hagberry*, is a tall shrub or small tree, sometimes reaching the height of 40 ft., growing wild in moist woods in Britain, and in most parts of Europe and the n. of Asia. Its younger branches are of a very dark or reddish-brown color. The drupes are small, of a sweetish subacid taste, combined with a degree of what many regard as nauseous bitterness; but to some palates they are not disagreeable. A well flavored spirituous liquor is prepared from them in the n. of Europe. In Siberia, the juice expressed from the ripe fruit is drunk either alone or mixed with milk, and the

remaining mass is kneaded into cakes, and used as food.—Very nearly allied to this species is the VIRGINIAN B. (*P.* or *C. Virginiana*), a tree of 80 to 100 ft. in height, found from Tennessee to Upper Canada, and now frequent in Britain as an ornamental tree, although never attaining the size which it does in the United States. The wood is compact, fine-grained, takes a fine polish, and is much used in America by cabinet-makers. The bark is used in the United States as a febrifuge. The fruit is not agreeable; but a cordial is made from it by infusion in spirits with sugar, and, when dried and bruised, it forms an esteemed addition to *pemmican* (q.v.).

BIRDE, WILLIAM, a distinguished ecclesiastical composer, was b. about the year 1540, and educated at Edward VI.'s chapel. In 1563, he was appointed organist in Lincoln cathedral, and twelve years afterwards organist to queen Elizabeth. He published numerous compositions exhibiting great musical learning, and contributed many pieces to queen Elizabeth's *Virginal Book;* but his fame rests on the canon *Non Nobis Domine,* which, amid all changes in musical taste, has retained its popularity, and still continues to challenge admiration. B. died in 1623.

BIRD ISLAND, the n.w. island of the Sandwich archipelago, in lat. 23° 20′ n., and long. 160° w. It is, as its name implies, a mere haunt of sea-fowl—the links of the chain increasing pretty regularly in size and elevation from B. I. on the n.w. to Hawaii on the s.e.

BIRD-LIME is a viscid and adhesive substance, which is placed on twigs of trees or wire-netting, for the purpose of catching the birds which may alight thereon. A common practice is to place a decoy or tame bird in a cage near where the B. is spread; the wild birds, attracted to the spot by the song of the tame bird, get entangled with the bird-lime. The substance is generally prepared from the middle bark of the holly, mistletoe, or distaff-thistle, by chopping up the bark, treating it with water, boiling for several hours, then straining; and lastly, concentrating the liquid by evaporation, when the B. assumes a gelatinous consistence resembling that of moist putty. It mainly consists of a substance named by the chemist *viscin.* A second mode of preparing B., is to employ ordinary wheat-flour; place it in a piece of cotton cloth; tie up the ends, so as to form a bag; immerse the whole in a basin of water, or allow a stream of water to flow upon it; and repeatedly squeeze the bag and its contents. The result is, that the starch of the wheat-flour is pressed out of the cloth bag, and an adhesive substance named *gluten* is left on the cloth. This substance resembles that prepared by the previous process in its properties; but the former mode of preparing B. is a much cheaper plan, and is that generally followed.

BIRD OF PARADISE, the common name of the family of birds, *paradiseidæ* of ornithologists, found chiefly in New Guinea and neighboring islnds, and remarkable for splendor of plumage. In all other respects, however, they are very closely allied to the crow-family, *corvidæ* (q.v.), to which they exhibit a great similarity, not only in the characters of the bill, feet, etc., and in general form, but also in their habits, and even in their voice. They have been the subject of many fables. The state in which their skins are usually exported from their native islands, gave rise to the notion that they were destitute of feet; and free scope being allowed to fancy, it became the prevalent belief that they spent their whole lives floating in the air, except when perhaps they suspended themselves for a little by their long tail-filaments from the uppermost branches of trees. As for their food, it was supposed to be either mere dew and vapors, or nectar obtained from the flowers of trees, climbers, and plants growing on the branches of trees, in the high regions of bright sunshine above the shade of the tropical forests. Antony Pigafetta, indeed, who accompanied Magellan in his voyage round the world, described them as having legs, and stated that these were cut off as useless in the preparation of the skins; but his statement was not credited, and Aldrovandus went the length of accusing him of an audacious falsehood. It would seem that the fables concerning the birds of P. are in part to be ascribed to the desire of the inhabitants of those islands in which they are found to increase the value of their skins as an article of merchandise; and a sort of sacred character being attached to them, they were employed not merely for ornament, but as a charm to secure the life of the wearer against the dangers of battle. The people of Ternate call them *Manuco-Dewata,* or birds of God; which name Buffon modified into *manucode.* In different languages they are known by names signifying birds of the air, birds of the sun, etc.

The males alone are birds of splendid plumage, that of the females possessing neither brilliancy of colors nor remarkable development. The plumage of the males is not only characterized by great brightness of tints, but by a glossy velvety appearance, a metallic luster, and a singularly beautiful play of colors. Tufts of feathers generally grow from the shoulders, and these, in some of the kinds, are prolonged so as to cover the wings; in the species sometimes called the common B. of P., and sometimes the great emerald B. of P. (*paradisea apoda*), the prolongation of these shoulder tufts is so great that they extend far beyond the body, and even far beyond the tail. They constitute the magnificent part of the well-known B. of P. plumes. They are exquisitely light and delicate. It has been supposed that they may be of use to the creature in enabling it, with less exertion of wing, to float in the air, but this notion is perhaps sufficiently confuted by the total absence of them in the female.—In other species, there

are elongated feathers on the back of the neck, which the bird can erect, and even in some measure throw forward at pleasure; and these, in the genus *lophorina*, assume a form resembling that of a pair of outspread wings, and rise far above the head. The tail is, in general, not unlike that of a crow in its shape; but in many species there arise, from the rump, at the sides of the tail, two very long feathers, or rather filaments, covered with a sort of velvety down: of these, the common B. of P. affords an example. In the king B. of P. (*cincinnurus regius*), these long tail-filaments terminate in a sort of disk, as the tail-feathers of the peacock do.

Birds of P. are, in general, more or less gregarious. They sometimes pass in flocks from one island to another, according to the change of seasons, from the dry to the wet monsoon. Owing to their plumage, they fly more easily against than with the wind, and by high winds they are sometimes thrown to the ground. They are lively and active, and in confinement pert and bold. They bestow great care upon their plumage, and sit always upon the perches of the cage, so that no part of it may reach the floor, or get in the least degree soiled. It has seldom been found possible to bring them alive to Europe, and they seem very incapable of enduring any other than a tropical climate. In confinement, they are easily fed on rice, insects, etc. In a wild state, their food consists in great part of the fruit of the teak-tree, and of different species of fig, and also of the large butterflies which abound in their native islands.

The Papuans kill birds of P. by shooting them with arrows, and employ various other means of taking them for the sake of their skins. The skins are dried in smoke, and fumigated with sulphur, to preserve them from insects; and in this way the brilliancy of the color is impaired, so that the most gorgeous plumes which are ever seen in Europe are inferior, in this respect, to those of the living bird. The skin, to which great part of the flesh is allowed to remain attached, is always much contracted by this drying process, and a very erroneous notion is therefore often formed of the size of the bird. The common B. of P. is as large as a jay. It is of a cinnamon color, the upper part of the head and neck yellow, the front and throat emerald green, the shoulder-tufts yellow. The whole length of the extremity of these is not less than two feet. Another nearly allied species (*Paradisea rubra*) has these long feathers of a brilliant carmine color.

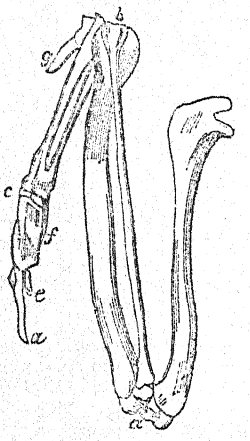
BIRDS (*Aves*), the second class of vertebrated (q.v.) animals, and the first of oviparous veterbrated animals, including all the oviparous animals which have warm blood. B. exhibit great similarity in their general structure, and are sharply distinguished from all other classes of animals. To this class belong all animals, except bats (q.v.) alone, which have an internal skeleton, and are capable of true flight. The anterior extremities of B. serve them only as wings or organs of flight, and never in any degree as arms or legs; those few birds in which the wings are too small to raise the body in the air, generally employ them to aid their swift running upon land, as the ostrich, or for swimming under water, as the great auk and the penguins. The body is covered with feathers (q.v.), and this is one of the characters in which all birds agree, and by which they are distinguished from all other animals. The general form is adapted to motion through the air, and the trunk is compact, and somewhat boat-shaped. The vertebral column possesses little flexibility; indeed, the vertebræ of the back generally become ankylosed or firmly united together by cementing bone, the solidity which is thus acquired being of evident use for the support of the ribs, and these also are proportionately stronger than is usual in quadrupeds; each of them is provided in the middle with a flattened bony process, directed obliquely backwarks to the next rib, so that they support one another, whilst instead of being united to the sternum, or breast-bone, by cartilages, as in quadrupeds, they are continued to it in the form of bone; all these things combining to give strength to that part of the body in which it is particularly needed, both in order to the powerful action of the wings, and the perfect freedom of respiration during flight. In those birds, however, which do not fly, the vertebræ of the back retain some power of motion. Ths hinder part of the vertebral column exhibits a solidity even greater than the anterior part of it, the lumbar vertebræ (q.v.) being consolidated into one piece with the pelvis (q.v.), which furnishes attachment to strong muscles for support of the trunk upon the legs, and for the motion of these organs. The vertebral column, however, terminates in a number of small movable (*coccygeal*) vertebræ, the flexibility of this part being necessary to the motion of the tail, which is itself supported by a short and generally much elevated bone, regarded as consisting of ankylosed vertebræ, called the rump-bone, or, from its peculiar form, the plowshare-bone.

In contrast to the general stiffness of the vertebral column in the trunk, it is remarkable for great flexibility in the neck, enabling a bird to make ready use of its bill, or to bring its head into such position as suit the adjustment of the center of gravity in flying, standing, etc.

The number of vertebræ in the neck varies from ten to twenty-three, the smallest number being greater than is found in any quadruped. The head, also, is so articulated to the neck, by a single *condyle*, or pivot, that a bird can turn its head round in a manner impossible to the mammalia. The skull itself is formed of bones corresponding with those of man and quadrupeds; but they can only be distinguished when the bird is very young, soon becoming consolidated together. The jaws are much elongated, so as to form the bill, the organ chiefly employed in seizing food, as well as for fighting, nest-

building, dressing or preening the feathers, and instead of a *hand* for every purpose which bird-life requires. The upper mandible of the bill is so connected, however, with the bone of the skull, by elastic plates, that it possesses some power of motion, and any shock which it may receive is much deadened before reaching the skull. The bill affords many of the most important distinctive characters of B., differing very much according to the mode of life of different orders and tribes. See BILL.

The sternum or breast-bone in B. is remarkably large and strong, serving for the attachment of the powerful muscles which depress the wings, and receives great attention from naturalists, because its variations correspond with the differences in some of the most important characters and habits of birds. It generally exhibits a projecting ridge along the middle, which is proportionately largest in birds of most powerful flight, and is wanting only in ostriches and a few other birds of allied genera which do not fly. The clavicles or collar-bones, also, are generally united to form the fourchette (*furcula*) or merry-thought bone, serving, along with two bones called the coracoid bones, to keep the shoulders separated, and to resist the compressing tendency of the action of the wings. The bones of the wing itself are regarded as corresponding to those of the anterior extremities in man and quadrupeds; the bones of the hand, however, being much disguised, and some of them wanting or rudimentary. In the accompanying cut of the bones of a bird's wing, *a* is regarded as the elbow-joint, *b* as the wrist-joint, *c* as the knuckle-joint, *d* being the representative of a finger, *e* and *f* the rudimentary representatives of two others, whilst the *winglet*, *g*, formerly regarded as representing the thumb, is now rather supposed to be homologous to the forefinger. The wings, therefore, exhibit a structure entirely different from those of bats, in which the fingers are extremely elongated. The surface necessary for striking the air is provided by feathers larger and stronger than those of other parts of the body, called *wing-feathers*, *quill-feathers*, or *quills*. Of these, which exhibit an admirable combination of strength with lightness and elasticity, some spring from the part of the wing between *b* and *d* (in the figure of the bones of the wing); these are always the largest, and are called the *primary* wing-feathers, or simply *primaries;* those which spring from the part between *a* and *b* are called *secondaries;* and those which spring from the part between *a* and the shoulder-joint are called *tertiaries*. At the base of the quills, on both sides of the wing, are feathers called *wing-coverts*, and these are likewise distinguished as primary, secondary, etc.. The feathers which grow over the shoulder-blades are called *scapulars*. The feathers of the wings vary in length and strength, according to the mode of life and power of flight in different B.; narrow, sharp, and stiff wings being indicative of swift and enduring flight. The tail-feathers serve the purpose of a rudder to guide the bird, and also that of balancing it in the air; they resemble in character the quills of the wings. They are also furnished with *coverts* above and below. Some B. have the tail rounded at the extremity; in some, it is square; in others, notched or forked. In many land B., the tail exhibits ornamental plumes, and remarkable developments of the plumage take place also in other parts of the body, in the form of crests, ruffs, shoulder-tufts, etc.



Skeleton of bird's wing.

The legs of B consist of parts corresponding to those found in man and quadrupeds; but the thigh is short, and so concealed within the body, that it is not apparent as an external portion of the limb; the next division, often mistaken for the thigh, being the leg strictly so called, or *tibia*, which ends at what is really the heel-joint, although popularly regarded as the knee; and beneath this is the shank or *tarsus*, which in some B. is very long, serving as a part not of the foot but of the leg, and formed by a single bone which represents both the tarsus and metatarsus. The feet are divided into toes, which are generally four in number, three before and one behind, differing from each other in length and in the number of joints or phalanges of which they are composed, the toe, which is directed backward, being in general comparatively short, and consisting only of two joints. A fifth toe or tarsal spur is found in some of the gallinaceous B.; and in some B., as bustards, the hind-toe is wanting; the ostrich has only two toes, both directed forward, with the obscure rudiment of a third; and numerous B. classed together in the order of climbers (q.v.) or yoke-footed B., including parrots, cuckoos, woodpeckers, etc., have two toes before, opposed by two toes behind, the foot being thus particularly adapted for grasping, so that parrots, as is well known, even use it as a hand.—The feet of B. vary considerably according to their mode of life; and naturalists therefore depend very much upon them in classification. In some the claws are strong and hooked; in others short, straight, and weak: in some the toes are all separate, in others more or less connected: in B. specially adapted for swimming, they are generally *webbed* or united by a membrane; in other swimming-B., however, a membrane only extends along the sides of each toe. In most B. the tarsus is feathered to

the heel-joint; in some, however, and particulary in *waders*, the lower part of it is bare; the shank and toes are generally, although not always, destitute of feathers, and are covered with a scaly skin. Almost the only other parts of a bird often destitute of feathers, are the *cere* at the base of the bill, and the combs and wattles of gallinaceous birds.

In order to flight, it is indispensable that the center of gravity of a bird should be under the shoulders; and when a bird stands, the feet are brought forward, and the head thrown back, so that the claws project beyond a vertical line passing through the center of gravity of the whole body. This is generally accomplished so that the trunk is in an almost horizontal position, the fore-part only a little elevated; but in some B., which have a short neck and short legs, an erect attitude is necessarily assumed, so that the penguins of the southern seas present to navigators a somewhat ludicrous resemblance to regiments of soldiers on the beach. B., when they sleep, very generally place their head under their wing, and some of them also stand upon one foot, their equilibrium being thus more easily maintained. A remarkable contrivance, particularly to be observed in storks and other long-legged B., renders this posture unfatiguing; a locking of the bone of one part of the limb into a sort of socket in the bone of the part above it, so that it retains its place without muscular exertion; whilst a similar purpose is served by the tendons of the muscles which bend the claws passing over the joints of the leg in such a manner as to be stretched by the mere pressure there when the weight of the bird rests upon the legs, so that without any effort the claws retain a firm hold of the branch upon which it is perched.—Flying is accomplished by the action of the wings upon the elastic and resisting air; the muscles by which the stroke of the wing is given are powerful, those by which it is retracted are comparatively weak. Owing to the manner in which the first strokes of the wing must be given, few B. rise with facility from a level surface; and some of them, as swallows, and particularly swifts, rise from a perfectly level surface with great difficulty, and comparatively seldom alight where they cannot find an elevation from which, as it were, to throw themselves.

The digestive apparatus of B. resembles that of mammalia; exhibiting, however, various modifications, according to the different kinds of food—some B. feeding on flesh, others on fish, others exclusively on insects, others on seeds, others more indiscriminately on a variety of animal and vegetable substances. Few B. masticate their food in any degree, although parrots do; upon being swallowed, it enters the *crop* or *craw*, sometimes called the first stomach, an enlargement of a œsophagus or gullet, situated just before the breast-bone, and here it is moistened by a secretion, which is also by some B.—particularly by pigeons—employed as the first food for their young, the glands of the crop enlarging very much, so as to produce it in large quantity at the time when it is wanted for that purpose. The crop is wanting in the ostrich, and also generally in B. that feed on fish; and is of greatest size in those of which the food consists of seeds or grain. It is generally single, and on one side of the gullet; sometimes, as in pigeons, it is double. A second stomach, or dilatation of the œsophagus, called the *proventriculus* or *ventriculus succenturiatus*, is generally largest in those B. in which the crop is wanting or small; and in this the food is further softened and changed by a secretion which is mixed with it. The third and principal stomach is the *gizzard*, which in B. of prey, fish-eating B., etc., is a mere membranous sac; but in B. which feed on grain or seeds is very thick and muscular, so that it acts as a sort of mill, and with extraordinary power. In these B., also, a remarkable provision is made for the perfect grinding down of the contents of the gizzard, by the instinct which leads them to swallow small rough pebbles or grains of sand, an instinct well exemplified in the common domestic fowl.—The liver of B. is, in general, very large. The kidneys are large, but there is no urinary bladder, and the urine is at once poured into the *cloaca*, an enlargement of the intestine, at its termination, with which also the organs of generation communicate in both sexes.

The respiration of B. is very perfect, and their blood is from 12° to 16° warmer than that of mammalia; its circulation more rapid, and the energy of all the vital processes proportionally great. B., consequently, exhibit great liveliness; and upon the admirable provision for the aëration of their blood they depend also for their powers of flight, which enable some of them to travel hundreds of miles with great rapidity and without exhaustion, whilst others soar to a prodigious height in the air. The heart resembles that of the mammalia in its form and structure; but the right ventricle, instead of a mere membranous valve, is furnished with a strong muscle, to impel the blood with greater force into the lungs. The lungs are small, and communicate with large air-cells (q.v.) in the cavities of the body, and even in the bones, so that the aëration of the blood takes place not only in the lungs but during its circulation through the body. An extraordinary proof of the use of these air-cells in respiration was afforded in a recorded instance of a large sea-fowl, which, when an attempt was made to strangle it, was kept alive by the air entering in a forcible current through a broken wing-bone (Gosse, *The Ocean*, quoting Bennett's *Whaling Voyage*.) B. consume much more oxygen in proportion to their size than quadrupeds.

The organs of the senses are similar to those of mammalia. In the senses of touch and taste, it is generally supposed that there is an inferior development, although parrots appear to possess the sense of taste in considerable perfection; and the bills of some B., which search among the mud for their food, are certainly very delicate organs of

touch. But the sight is remarkably keen, and the eye possesses great powers of accommodation to different distances. B. perceive even small objects distinctly, at distances at which they would be quite indistinguishable to the human eye, and thus are enabled to seek their food. B. of prey also appear to possess in great perfection the sense of smell. The nostrils of all B. open on the upper surface of the bill. Hearing is acute in B., and particularly in nocturnal B., although the organs of this sense are less complicated than in mammalia, and there is seldom any vestige of an external ear. Singing-B. are extremely sensitive to differences of pitch. The voice and musical powers depend upon the conformation of the windpipe and larynx, which differs very much in different birds.

Reproduction takes place by eggs (see REPRODUCTION and EGG), which are hatched after they have passed from the body of the mother. B. generally sit upon their eggs, their bodies supplying the warmth necessary to hatch them (see INCUBATION); and this office is usually undertaken by the female alone, but sometimes is shared by the male. In very warm climates, the ostrich leaves her eggs to be hatched by the heat of the sun, but in colder climates sits upon them. A very few B., as the cuckoo, deposit their eggs in the nests of other B., to be hatched by them. Some B. construct no nest, but lay their eggs on the bare rock, as many sea-fowl do, or in holes rudely scratched in the earth or sand; many, however, show in the construction of their nests the most admirable instincts. See NESTS. The number of eggs varies, in a state of nature, from 1 to about 20, being generally smallest in the larger B., and particularly in B. of prey. B. generally breed only once a year, but some B. twice. The care which B. take of their young is as admirable as the ingenuity which they display in nest-building, and more universal. Some B. are able to run about, and pick up food as soon as they leave the shell; others remain in the nest for days, or even weeks, and must be supplied with food by their parents. Many species are social, particularly at the breeding-season, and form large settlements, which they guard in common; and some even unite in the construction of large nests, which belong to a whole community. The rapacious B., and particularly the larger ones, are very solitary in their manner of life.

B. change their feathers (*molt*), in general, once a year, and the colors of the plumage in many cases vary much in summer and winter. The change of color, however, often takes place without change of feathers, and in B. which molt both in spring and autumn, the autumn molting is much more complete than that of spring. The gayest plumage of many B. is assumed at the breeding-season, with which, also, the song of B. is connected. See SONG OF BIRDS. The plumage of the male is, in general, more gay than that of the female, all the young at first resembling the female in plumage. The plumage usually characteristic of the male is occasionally assumed by the female, and most frequently by females which have become unfit for the ordinary functions of their sex.

The brain in B. differs in some important respects from that of mammalia (see BRAIN), presenting resemblances to the brain of reptiles and fishes; but it is of large size, often larger than even in quadrupeds. The manifestation of intelligence is not, however, usually so great in B. as in quadrupeds. Their nest-building, their migrations (see BIRDS OF PASSAGE), and many other things of greatest interest, must be ascribed to instinct.

In the geographical distribution of B., the limits of species are not so exactly circumscribed by mountains, seas, and rivers as in other classes of animals, their powers of flight enabling them to pass over these obstacles. Yet some species, and even groups, are found exclusively in certain regions: thus humming-birds are all American, penguins are found only in the southern seas, and B. of paradise are confined to New Guinea and the neighboring islands. See SPECIES.

The free movements of B. through seemingly boundless space, the joyous song of many, and the characteristic tones of all—their brilliant colors, their lively manners, and their wonderful instincts—have from the earliest ages made a strong impression on men's minds, and in the infancy of intellect gave rise to many peculiar and mysterious associations with this class of creatures. Hence the flight of B. was made the foundation of a particular art of divination. See AUGURIES and AUSPICES. Religion borrowed many of its symbols from them, and poetry many of its ornaments.

In an economical point of view, B. are very important. The flesh and eggs of almost all B. may be eaten, although those of B. of prey and of fish-eating B. are generally reckoned unpleasant. Their feathers are employed for various purposes of use and ornament; their dung is valuable for manure, and guano (q.v.) is nothing else than the accumulated dung of sea-fowls. Many B. are extremely useful in preventing the multiplication of insects and worms, and compensate in this way for the mischief which they occasionally do in fields and gardens. Domestic poultry are a source of considerable profit, upon account of their eggs, flesh, and feathers. See POULTRY. Some kinds of B. of prey have been tamed, and trained to the use of the sportsman. See FALCONRY.

About 5000 existing species of B. are known. As to their systematic arrangement, see ORNITHOLOGY.

The order of B. presents in the dodo (q.v.) a remarkable and well-ascertained instance of the recent extinction of a species, and even of a genus. It is also a remarkable and

interesting fact that the greater part of the remains of extinct B. hitherto discovered are those of land-birds destitute of the power of flight, like the dodo, and the still existing ostrich, cassowary emu, and apteryx. A particular interest is attached to those of the gigantic *dinornis* (q.v.) of New Zealand. See next article.

BIRDS, Fossil. While the animal and vegetable kingdoms of the paleontologist extend to as wide, or rather a wider, range than those of the historian of modern life, yet several divisions are scantily represented in the petrified remains preserved in the stony records of the earth's crust. This was to be expected from the conditions under which these fossiliferous strata were deposited. As these rocks are aqueous, chiefly marine, the relics of plants and animals whose natural habitats were in or near the water, must be common in a fossil state, whilst the remains of others with different habits will be comparatively rare, if present at all. Birds belong to this latter class. Their power of flight would save them from numerous casualties which would prove fatal to quadrupeds; and even if they did perish in water, the lightness of their bodies, produced by their internal cavities and the quantity of their feathers, would keep them floating until they decomposed, or became the food of predaceous animals.

The earliest traces of birds consist of footprints on red argillaceous sandstones in the valley of Connecticut river, North America. These sandstones, though long considered of a much older date, have been, on the best evidence, referred by the brothers Rogers to the oolitic period. The beds had formed an ancient sea-beach, and over it, during the recession of the tide, had marched the animals, which have left on them their footsteps. Before the return of the tide, the inequalities had been filled up with dry air-drifted sand and mud, and on this was deposited a new layer of silt. The beds often exhibit ripple-marks, and occasionally small circular depressions, which have been formed by drops of rain. The traces of thirty-three species of B. have been distinguished; with them are associated the impressions of various lizards, chelonians, and batrachians. The size of the ornithichnites (Gr. *ornis*, a bird, and *ichnon* a trace or footprint), as the bird-tracks are called, so far exceed those that would be made by the largest living birds, that it was doubted whether their origin had been satisfactorily explained, until the discovery, in New Zealand, of the remains of the *dinornis*. In one species the imprint of the foot measures 15 in. in length, and 10 in. in breadth, excluding the hind claw, which is 2 in. long. The distance of the impressions from each other varies from 4 to 6 feet. These measurements indicate a bird about four times the size of an ostrich, but probably not much larger than some species of *dinornis*. The footprints are for the most part trifid, and show the same number of joints as exist in the living tridactylous birds.

No indications of the existence of birds have been discovered in the rocks of the cretaceous period. It does not follow, however, that the class *aves* had no representatives during the ages when the chalk was being deposited. This is a deep-sea formation, and for the reasons already stated, it is not to be expected that the remains of this class should be found in these measures. And so also it would be rash to conclude that the oolitic footprints give the date of the first appearance of B. on the globe. The bone of *cimoliornis diomedeus*, found in the chalk, which was described by prof. Owen as part of the humerus of a bird, is now believed to belong to a pterodactyle.

No true fossil remains of B. have been discovered in rocks older than the eocene-gypseous deposits of Montmartre, where ten species have been found. Seven species have been described from strata of the miocene period, the most important of which have been found in the Sewalik beds, associated with the remains of huge proboscidea. But the pleistocene deposits have supplied more than half of the known fossil birds. The most remarkable of these are the bones of huge struthious B. of the genera dinornis (q.v.), palapteryx (q.v.), and aptornis. Dr. Mantell mentions the fossil eggs and bones of a bird still larger, called the æpyornis, from Madagascar.

BIRD'S-EYE LIMESTONE is a division of the Trenton group of the lower Silurians of North America, apparently equivalent to the Llandeilo flags, and containing, besides the remains of brachiopods, many enormous orthoceratites.

BIRD'S-EYE VIEW is a term applied generally to modes of perspective in which the eye is supposed to look down upon the objects from a considerable height. If the eye is considered as looking perpendicularly down while it sweeps over each point of the scene in succession, we have an exact ground-plan; no object covers another, horizontal angles and distances are exactly represented; while, on the other hand, no vertical angles or side-views appear. In sketching or drawing a locality for military or economical purposes, this kind of perspective is always used. The great difficulty is to represent at the same time the relative heights of mountains and steepness of acclivities. But the more usual kind of bird's-eye views differ from common perspective only in the horizontal line being placed considerably above the picture. In the 16th c. the only kind of views known were of the nature of ground-plans, and the artists of the 17th c. tried to combine this method with side views.

BIRD'S FOOT, *Ornithopus*, a genus of plants of the natural order *leguminosæ*, suborder *papilionaceæ*, deriving both its popular and its botanical name from the resemblance of the curved pods to birds' claws; the leaves are pinnate, with a terminal leaflet. One species (*O. perpusillus*) is a native of Britain, growing on dry, sandy, or gravelly soils—a

small plant of little importance, the flowers of which are white, striated with red. But *O. sativus*, an annual growing to the height of 2 or 3 ft., a native of Portugal, is cultivated in that country as green food for cattle, and is very succulent and nutricious. Like its British congener, it grows well on very poor soils. Its Portuguese name is serradilla.

BIRD'S FOOT TREFOIL, *Lotus*, a genus of plants of the natural order *leguminosæ*, sub-order *papilionaceæ*. The pods are cylindrical, somewhat spongy within and imperfectly divided into many cells. The name B. F. T. is derived from the resemblance of the clusters of pods to a bird's foot. It has received the name *lotus* from botanists, because a species of this genus is supposed to have been one of the plants so named by the Greeks. See LOTUS. The species, which are pretty numerous, are natives of the temperate and colder regions of the old word. The COMMON B. F. T. (*L. corniculatus*) is very abundant everywhere in Britain in pastures. It has a stem 6 to 12 in. in length, decumbent, and bearing umbellate heads of 8 to 10 yellow flowers, which have a rich honey-like smell. The leaves have three obovate leaflets, like those of the true trefoils or clovers, but at the base of each leaf-stalk there are also two large leaf-like ovate stipules. The plant is by some regarded as the shamrock (q.v.) of Ireland. It is eaten with great avidity by cattle, and its deeply penetrating roots adapt it well for very dry situations.—A larger species, otherwise very similar, by many regarded as merely a more luxuriant variety of this, with stem nearly erect, more compact heads of smaller flowers, and much smaller seeds, is the GREATER or NARROW-LEAVED B. F. T. (*L. major*), which also is a common native of Britain, generally found in moist, bushy places. The characteristic differences remain under cultivation in every variety of soil and situation. A species called the winged pea (*L. tetragonolobus*), remarkable for four membranous wings which run along its pods, a native of the s. of Europe, is frequently cultivated in gardens in Britain amongst other annual flowers; but in some parts of Europe it is cultivated for its seeds, which are used as a substitute for coffee.

BIRD'S NEST, EDIBLE, that of a sea-swallow, *hirundo esculenta*, of the Chinese coast and adjacent islands; made of glutinous vegetable matter gathered from coral or other rocks, swallowed by the bird, and thrown up when wanted for use. A nest is a little larger than a common tea-cup, and when new is white and at its best value, growing less valuable as it is used. The nests are in sea-caverns and the most inaccessible places, so that to get at them men are lowered by ropes over fearful precipices. The nest is used for food only by the Chinese, who take the whole supply, perhaps 25 tons annually, at prices ranging from $5 to $35 per pound. Its aphrodisiac qualities are the reason of its value with the celestials.

BIRDS OF PASSAGE are those birds which spend one part of the year in one country or climate and another part in another, migrating according to the season. No species of bird is known to hibernate (see HIBERNATION); and although many naturalists were at one time inclined to believe in the hibernation of swallows, this opinion has been entirely relinquished, and their annual migrations are fully ascertained. Birds avail themselves of their powers of wing to seek situations adapted for them in respect of temperature and supply of food, and even within the tropics there are birds which migrate as the seasons change from wet to dry, or from dry to wet. See BIRD OF PARADISE. The migration of birds, however, is more generally from n. to s., or from s. to n., in the temperate and colder regions of the globe, as winter passes into summer, or summer into winter; and B. of P. are commonly distinguished into summer B. of P. and winter B. of P., as they are summer or winter visitants; but, of course, those which are summer B. of P. in one country are winter B. of P. in another. They breed in the country in which they are summer B. of P. The arrival of summer B. of P. is always among the welcome signs of advancing spring, and is associated with all that is cheerful and delightful. In winter, flocks of swans, geese, and other water-fowl seek the British coasts and inland lakes and marshes from the frozen north; and at the same time, wood cocks, fieldfares, redwings, and many other birds which breed in more northern regions, regularly appear. Some birds come almost at the same date annually; others are more influenced by the character of the season, as mild or severe. Many sea-fowl are migratory, and the inhabitants of St. Kilda and other isles, to whom they are of the greatest importance, depend with confidence upon their return almost at a particular day. The migrations of pigeons in North America are extraordinary, from the vast numbers of which the migrating flocks consist. See PIGEON. The whole subject of the migration of birds is one of great interest, particularly in reference to the instinct by which they appear to be guided. Birds of migratory species, which have been reared in confinement, become restless when the season for migration arrives, and in many species the migration seems to be little influenced by the state of the weather. It would seem that the youngest swallows are left behind, to follow the first migrating hosts of their species. The number of B. of P. is very considerable, nor are they all or mostly birds of long wing and powerful flight, but many short-winged birds are included among them. Some B. of P., as woodcocks, have, however, been found in a very exhausted state after their arrival; and it is to be considered that, both in the old and new world, distant migrations are possible without long flights. Some birds possess such powers of wing, that they may easily pass over wide seas; and the rapidity of the flight of birds—from

50 to 150 m. an hour—partly explains the possibility of their migrations between distant parts of the world. It is believed that B. of P. habitually return to the same localities which they have inhabited in former years, and this seems to have been sufficiently established by proof, at least in regard to swallows.

BIRDS OF PREY, a common English appellation of the order of birds called *accipitres* (q.v.) by Linnæus. Some birds, however, which do not belong to this order, frequently pursue and prey upon other birds. If those which make fishes, insects, and worms their food, were also reckoned, great part of the whole class of birds must be considered predaceous. B. of P. are very commonly divided into two sections—*Diurnal* and *Nocturnal;* the latter consisting exclusively of owls.

BIRIOU'TCHÉ, or BIRIU'TCH, a t. in the government of Voronej, Russia, on the left bank of the Sosna, a tributary of the Don. It is surrounded with earthen ramparts and a ditch, and has four annual fairs. Pop. '67, 3062. A stream of the same name in its immediate vicinity is noted for its pearl-oysters; and the teeth of elephants are often found exposed on its banks.

BIRKBECK, GEORGE, M.D., distinguished for the leading part he took in founding mechanics' institutions, and in the education of the working-classes, was b. at Settle, in Yorkshire, Jan. 10, 1776. He commenced his medical studies at Leeds, and pursued them at Edinburgh, where he made the acquaintance, among others, of Sydney Smith, Brougham, Jeffrey, and Horner. Appointed to the chair of the Andersonian institution in Glasgow, he delivered his first course of lectures on natural and experimental philosophy in the winter of 1799. He took a leading part, along with Brougham and others, in the formation of the London mechanics' institution—the first of its kind in the kingdom—and was chosen its president for life. He died in London, Dec. 1, 1841.

BIRKENFELD, a principality of Oldenburg, adjoining the Rhenish district of Coblentz and Treves; 194 sq.m.; pop. '71, 36,128. It is a mountainous region covered with forests, and has mines of iron. In 1802, France had possession, Prussia in 1815, and it was ceded in 1817 to Oldenburg. Chief town, Birkenfeld; pop. 2249.

BIRKENHEAD, a market t., sea-port, and parliamentary borough in the parish of Bidston, and hundred and union of Wirral, Cheshire, lies opposite Liverpool, on the left bank of the Mersey. The parliamentary borough, which was constituted in 1861, when one of the seats rendered vacant by the disfranchisement of Sudbury and St. Albans was assigned to it, includes, besides the chapelry of B., the townships of Claughton, Oxton, Tranmere, and part of Higher Bebington. Pop. (1871) of the township, 42,981; of the parliamentary borough, 65,971. B. has within the last few years risen from comparative obscurity to its present important position. No later than 1818, only a few straggling houses existed, and the pop. numbered 50. In 1821, it amounted only to 236. The principal streets of B. are laid out with great regularity, crossing each other at right angles, and about 20 yards wide; but the back streets are narrow and the houses mean. Hamilton square, a quadrangle of about 8 acres, is scarcely excelled by any buildings in the United Kingdom. The park is a splendid feature of B., consisting, as it does, of 190 acres. B. is so situated as to have communication with the entire railway system of the country. A railway bridge over the Mersey at Runcorn was opened for traffic in 1869, which shortened by 10 m. the distance between the Liverpool and Birkenhead docks. It is to these docks chiefly that B. owes its rapid development and prosperity. The original idea is due to the late Mr. Laird, who in 1824 purchased, at a very low price, a large piece of ground on the borders of the Wallasey pool, on which he meant to start a ship-building yard. Discovering the capabilities of the site, he began to project plans for extensive docks; and the corporation of Liverpool, dreading the rivalry, purchased the pool and the lands about it; and in 1847, two docks, the Morpeth and the Egerton, were opened by lord Morpeth, the chief commissioner of woods and forests. Other docks, and a great floating harbor, were subsequently added, and now they have a reputation wide as the world, as splendid specimens of engineering skill.

B. has for some years been celebrated for its ship-building yards, some of the largest iron ships afloat having been built there by extensive firms. The too historical *Alabama* was built by the Messrs. Laird, to whose enterprise, more than that of any other company, the town owes its present eminence. In the neighborhood of the docks are the Canada works for the construction of gigantic bridges, the Britannia machinery works, and others.

B. owes its origin to a Benedictine priory founded there in the 12th c., of which some remains still exist. Edward II. granted the entire monopoly of the ferries to its monks. The remains of the monastery are still in a tolerable state of preservation, exhibiting some fine specimens of the English architecture of the period of its foundation.

BIRKET-EL-KEROON, a lake in Fayoom, Egypt, 30 m. by 6, communicating with the Nile and the canal said to have been made by Joseph. It was once connected with lake Mœris, with which it was often confounded. The name means "lake of the horn," and alludes to its shape.

BIRMAH. See BURMAH.

BIRMINGHAM, a village in Connecticut, at the junction of the Naugatuck and Housatonic rivers, 11 m. w. of New Haven, on the Naugatuck, and the New Haven and Derby railroads; pop. '70, 2103. The first large manufactory of pins in the United States was begun in New York in 1836, and removed to B. in 1838. There are also rolling-mills, spring and axle factories, and other metal-working industries. B. is connected with Derby by a bridge over the Naugatuck.

BIRMINGHAM, the chief t. in Britain for metallic manufactures, and supplying much of the world with hardwares, stands near the center of England, in the n.w. of Warwickshire, with suburbs extending into Staffordshire and Worcestershire, 112 m. n.w. of London. Built on the e. slope of three undulating hills, on the Rea and the Thames, on a gravelly foundation overlying clay and new red sandstone, and supplied with plenty of water, it is one of the best drained towns in England, while the means which have been adopted for the prevention of smoke-contamination of the atmosphere are so far effectual that the air is unusually clear and salubrious. The older part of B. is crowded with workshops and warehouses; but the modern is well built, and possesses some architectural beauty. Among the finer buildings are the post-office, the corporation buildings, the town hall, the exchange, the rooms of the royal society of artists. B. began very early to be the seat of iron manufactures, from its vicinity to a forest and extensive iron mines; but its industry and trade were long small. Its high commercial importance dates from the 17th c., when the restoration of Charles II. brought from France a fashionable rage for metal ornaments, and B. supplied the demand with unexampled vigor. From being the "toy-shop of Europe" of Burke's time, B. now constructs steam-engines, hydraulic-presses, and crystal palaces; and its hardwares are unequaled in the world for quantity, variety, and value. Pop. 1690, 4000; 1801, 60,822; 1851, 232,841; 1861, 296,076; 1871, 343,787. B. returns three members to parliament. It produces upwards of £5,000,000 worth of goods yearly, chiefly articles made of gold, silver, iron, brass, steel, mixed metal, plated metal, glass, papier-maché, japanned and electrotyped articles; including firearms, ammunition, swords, metal ornaments, toys, jewelry, buttons, buckles, lamps, pins, steel-pens, tools, locks, bedsteads, saddlery, steam-engines, and all sorts of machinery. In B. 1000 ounces of gold are made into chains weekly; at least 70 ounces of gold-leaf are used weekly; 30,000 gold rings are made yearly; 150,000 ounces of silver are used yearly; a billion of steel-pens are made yearly, more than 500 tons of steel being used; above 80,000 copper coins are struck daily; 20,000,000 nails are made weekly at one work; 5,000,000 firearms were made between 1804 and 1818; and during the Crimean war the government were supplied with 3000 muskets weekly. The button manufacture of B. is very large. The steam-engines in B. are estimated as equal to 10,000-horse power, and consume 600 tons of coal daily. In B. above 20,000 families are engaged in trade, manufacture, and handicraft. B. has more than 170 places of worship, about 60 belonging to the Establishment; a grammar-school, founded in 1552, with a yearly revenue of £12,000; a queen's college connected with the London university; a well-conducted literary and scientific institute (the Midland institute); a free reference and central public library, also five free branch libraries; a Roman Catholic college and cathedral; a botanic garden; an art-gallery; and four public parks. It is famed for its charitable institutions, and in B. was originated the system of annual collections for local charities. The town-hall can hold 6000 persons, and has a magnificent organ, and a musical festival is held in it once every three years. Of the many ways of spelling the name of this city, the oldest is that given in *Doomsday Book*—namely, Bermingeham. This was corrupted into Brummagem, a name which has become synonymous with worthless wares with a glittering outside. B. took the parliament side in 1643, supplying swords, and using them well against prince Rupert and his lancers. In 1791, a B. mob denounced the distinguished Dr. Priestley as an atheist and Jacobin, destroyed his house, library, and apparatus, besides much other property; a statue has recently been erected to his memory. Near Handsworth, a little to the s. of B., were the famous Soho works, founded by Watt and Boulton, where steam-engines were first made. Handsworth church has a statue of Watt by Chantrey, and a bust of Boulton by Flaxman. Darwin, author of *Zoonomia,* and Withering the botanist, lived in Birmingham. Thomas Attwood originated the political union here, which greatly hastened the passing of the reform act in 1832, and the enfranchisement of Birmingham.

BIRNAM, a hill 1580 ft. high, in the e. of Perthshire, near Dunkeld, 12 m. n.w. of Perth, and 12 m. w.n.w. of Dunsinnan hill, one of the Sidlaws. It commands a fine view of the valley of the Tay. It was formerly covered by part of an ancient royal forest. Shakespeare has immortalized B. wood in his tragedy of *Macbeth.*

BIRNEE, OLD and NEW, the name of two towns of Burnu, central Africa. Old B., which was formerly the chief city of the empire, walled and of vast extent, is situated on the banks of the Yeu, about 70 m. n.w. of the modern capital, Kuka, or Kukawa, and about 75 m. w. of lake Tsad, in lat. 13° n., and long. 13° 15′ e. It is now greatly deserted and decayed, but it has still a population estimated at 10,000, and considerable markets. New B. is about 20 m. s. of Kuka, is walled, and has a large mud palace. Population about the same as that of Old Birnee.

BIRNEY, DAVID BELL, 1825–64; b. Alabama; son of James G. He entered the union service during the civil war, and rose to the rank of brig.gen., commanding a division at the battle of Gettysburg.

BIRNEY, JAMES G., 1792–1857; b. Kentucky; graduate of the college of New Jersey; went to Alabama, where he practiced law and became a member of the legislature; removed to Kentucky, and was a professor in Danville university. In 1834, he emancipated his own slaves and advocated universal liberty, shortly afterwards settling in Cincinnati, and starting *The Philanthropist*, one of the earliest journals to advocate the abolition of slavery, for which the printing-office was several times mobbed and partially or wholly destroyed. He was secretary of the American anti-slavery society, and prominent in the organization of the liberty party, which, in 1840, and again in 1844, made him their candidate for president. In the latter year he got 62,300 votes in 13 states, and his candidacy deprived Henry Clay of the electoral votes of both New York and Michigan, thereby electing Polk and securing the annexation of Texas, and a wide extension of the slavery to which B. was himself so ardently opposed. But this extension of slavery opened the way for those demands in its behalf which ended in secession and rebellion, and, through these, in its abolition.

BIRNEY, WILLIAM, son of James G., was a union officer in the civil war, and rose to be brig.gen. of volunteers. FITZHUGH, youngest son of James G., died in the union service with the rank of colonel.

BIRON, ARMAND DE GONTAULT, Duc de, d. July 26, 1592; a French gen. of the 16th c.; grand master of artillery, commanding at the siege of Rochelle and in Guienne. He was among the first to declare for Henry IV. He brought Normandy under subjection, and dissuaded Henry from going to England. B. was killed by a cannon-shot at the siege of Epernay.

BIRON, or BIREN, ERNEST JOHN DE, Duke of Courland, b. 1687, was the son of a landed proprietor in Courland, of the name of Bühren. He studied at Königsberg, and in 1714 visited St. Petersburg, where his handsome person and cultivated mind soon gained him the favor of Anna Ivanovna, niece of Peter the great. When Anna ascended the throne of Russia in 1730, Biron repaired to court and was loaded with honor. He assumed the name and arms of the French dukes de Biron, and soon swayed all Russia through his royal mistress. Proud and despotic by nature, he hated every one who stood in the way of his ambition. The princes Dolgorucki and their friends were his first victims. More than a thousand persons were executed by his orders, and a still greater number sent into banishment. The empress is said to have often thrown herself at his feet to induce him to relent, but her prayers and tears were of no avail. It is, however, undeniable, that by the strength of his character he introduced vigor and power into every branch of the public administration throughout Russia. In the year 1722, he married a Courland lady, and in 1737 the Courlanders were compelled to choose him as their ducal ruler. By his desire the empress, on her death-bed, appointed him guardian and regent during the minority of her presumptive heir, prince Ivan. On the death of the empress (28th Oct., 1740), Biron assumed the regency, and acted with great prudence and moderation. A secret conspiracy was, however, soon formed against him, and on the night of the 19th Nov. he was arrested, by the orders of field-marshal Münnich, and conveyed to the fortress of Schlüsselburg, where he was tried and sentenced to death. His sentence was afterwards commuted to imprisonment for life, and confiscation of his property. He was now, along with his family, conveyed to Pelim, in Siberia. When, in the following year, Elizabeth ascended the throne of Russia, B. was recalled, and Münnich sent to occupy his prison in Siberia. The sledges met at Kasan; the two enemies looked at each other, but continued their journeys without exchanging a word. During the remainder of Elizabeth's reign, B. continued to reside with his family at Jaroslaw. The empress Catharine II. restored to him the duchy or Courland, and he died 28th Sept., 1772.

BIRON, CHARLES DE GONTAULT, Duc de, 1562–1602; son of Armand; made duke of Biron and admiral of France by Henry IV. He was a man of great intrepidity, but fickle and treacherous. He was sent to England in 1601 to announce the marriage of Henry with Mary de Medici; but about the same time he was caught in treasonable correspondence with Spain, and was beheaded in the Bastile.

BIRR. See PARSONSTOWN.

BIRS, a small but famous affluent of the Rhine. It rises in the canton of Bern, Switzerland, near the pass of the Jura called Pierre Pertuis, flows in a north-easterly direction through the Münsterthal, and enters the Rhine near Basel. In a narrow gorge through which the stream breaks, at a little distance from that city, 500 confederate Swiss died heroically, on the 26th Aug., 1444, in battle against the French army under the dauphin Louis. On the same river, near the village of Dornbach, about a mile and a half s. of Basel, 6000 confederate Swiss gained a splendid victory over 15,000 Austrians, under Fürstenberg, on the 22d of July, 1499; in consequence of which, the emperor Maximilian signed a peace at Basel on the 21st of September following.

BIRS NIMRUD. See BABEL, TOWER OF, *ante*.

BIRSTALL, a parish in Yorkshire, England, s.w. of Leeds; pop. '71, 43,405; with manufactories of silk, cotton, wool, etc., and coal and iron mines.

BIRTH. The act of coming into life has an important legal bearing in regard to the evidence of its legitimacy or illegitimacy. These qualities are variously determined by the regulations of different systems of jurisprudence. The ancient Roman law, as well as the modern Prussian and French codes, in particular, contain anxious provisions on the subject. In England, no precise time appears to be prescribed for fixing legitimacy or illegitimacy of birth. Forty weeks is considered, in practice, the more usual time for legitimate births, but a discretion to allow a longer time is exercised, when, in the opinion of medical men, or under the peculiar circumstances of the case, protracted gestation may be anticipated, or is likely to occur. In Scotland, the law is more distinct. There, in order to fix bastardy on a child, the husband's absence must continue till within six lunar months of the birth, and a child born after the tenth month is accounted a bastard. The fact of legitimacy or illegitimacy may be judicially determined by an action of declarator in the court of session, which concludes, according to the nature of the case, for the legitimacy or illegitimacy of the party whose birth is the subject of the legal inquiry. In England, legitimacy may be ascertained by proceedings in the court for divorce and matrimonial causes, under the 21 and 22 Vict. c. 93, called the "legitimacy declaration act, 1858;" but there the remedy is not so complete as that afforded by the Scotch declarator, which may decree not only legitimacy, but also *illegitimacy*. See BASTARDY, HEIR, INHERITANCE.

BIRTH, *ante*, the act or fact of being brought into the world. To fulfill the condition of a living birth the whole body must be brought into the world and detached from the mother, and after such detaching the child must be alive and must have in action the changed and independent system of circulation which follows the severance of the umbilical cord. And yet, the killing of a living child before the separation of the cord is held to be murder, except when necessary for saving the mother's life.

BIRTH, CONCEALMENT OF, is an offense against the public economy, and punishable as a misdemeanor. By the 9 Geo. IV. c. 31, s. 14, it is enacted, that any woman endeavoring to conceal the birth of a child, shall be liable to be imprisoned, with or without hard labor, for any term not more than two years: and it shall not be necessary to prove whether the child died before, at, or after its birth. It is also provided, that if any woman tried for the murder of her child shall be acquitted thereof, it shall be lawful for the jury, so acquitting her, to find her guilty (if the case be so) of concealing the birth: upon which the court may pass the same sentence as if she had been committed upon an indictment for the concealment.

In Scotland, the law on this subject appears to be regulated by the 49 Geo. III. c. 14, by which it is enacted, that if a woman shall conceal her being with child during the whole period of her pregnancy, and shall not call for, or make use of help or assistance in the birth; and if the child shall be found dead, or be amissing, she shall be imprisoned for a period not exceeding two years. It has, however, been decided, that disclosure by the mother to the putative father is a sufficient defense. The punishment usually awarded for this offense in Scotland, is imprisonment from three to six, and in aggravated cases, from nine to eighteen months. See PREGNANCY, CONCEALMENT OF.

BIRTHRIGHT. See INHERITANCE, and PRIMOGENITURE.

BIRTHS, REGISTRATION OF, as also that of *burials* and *marriages* (q.v.), is regulated by the 6 and 7 Will. IV. c. 86, amended by the 7 Will. IV. and 1 Vict. c. 82, by which a general register-office for the whole of England is established. The registrar-general shall, under the act, furnish a sufficient number of strong iron-boxes to hold the register-books, and every such box shall be furnished with a lock and two keys, one of which shall be kept by the registrar, and the other by the superintendent-registrar; and while the register-books are not in use, they are to be kept in the register-box, which shall always be kept locked. The form for general registration of births, comprises the time of birth, name and sex of the child; the name, surname, maiden surname, and profession of the parents; the signature, description, and residence of the informant (who must be the father or mother, or in case of their inability, the occupier of the house, s. 20); the date of registration and signature of the registrar; and also the child's baptismal name (if any be given after registration, within six months). Searches may be made, and certified copies obtained, at the general registrar-office, or at the office of the superintendent-registrar of the district, or from the clergyman, or registrar, or any other person who shall for the time being have the keeping of the register-books. By 3 and 4 Vict. c. 92, provision is made for depositing with the registrar-general a number of non-parochial registers and records of births, baptisms, deaths, burials, and marriages, which had been collected by a commission appointed for that purpose, and for rendering such registers and records available as evidence. For other regulations on the subject of this article, see 21 Vict. c. 25.

The Scotch law relating to the registration of births commenced with 17 and 18 Vict. c. 80, by which a registrar-general, parochial registrars, and other officers are appointed with suitable machinery for carrying out the provisions of the act. It is the duty of the

local registrar to ascertain and register all births within his parish or district, without fee or reward, save as provided by the act; but parents, or persons in charge of children after their birth, are required to give information of such births, and to sign the register; and after the expiration of three months following the day of birth, it shall not be lawful for the registrar to register the same, except as provided by the act. The act declares that the sheriff of the county shall have the care and superintendence of the parochial registrars; and, as in England, the registrar-general is directed to furnish strong iron boxes to hold the registers and other documents, such box to have a lock with two keys, one of which shall be kept by the registrar, and the other by the sheriff. The 36th section contains the noticeable provision, that in the case of children legitimated by subsequent marriage of the parents, but who were originally registered as illegitimate, such registration shall be corrected by an entry of the marriage on the margin. The act contains other provisions, more or less corresponding to the enactments of the above English statutes, and has been amended by the acts 18 and 19 Vict. c. 29; 19 and 20 Vict. c. 96; and 23 and 24 Vict. c. 85.

BIRTHS, REGISTRATION OF, and of MARRIAGES and DEATHS (*ante*), formerly entirely neglected, but of late years regulated by law in several of the states, especially in Massachusetts, New York, and New Jersey. The record of deaths has been passably well kept in all the country for many years, but not until recently have those of marriages and births been so treated. At present the officiating minister, priest, or magistrate at a wedding, and the physician or midwife at a birth, are required, under penalty for failing to do so, to report to the proper bureau the name, age, sex, nativity, color, and social condition of the persons who marry, and the sex, color, and nativity of parents in case of birth. The U. S. census reported the number of deaths (in the census year) in 1850, and in 1880 the bureau is making a special effort to have the record comprehensive and complete.

BIRTHS, DEATHS, AND MARRIAGES. See VITAL STATISTICS.

BIRTHWORTH. See ARISTOLOCHIA.

BIRU', BEEROO', or BEROO', a kingdom of Sudan, western Africa, in lat. 15° to 16° n., long. 5° 30′ to 7° 15′ west. It is bounded on the n. by the Sahara, on the e. by the Niger, and has Bambarra on the south. Its western limits are not clearly defined. The capital t., Walet, is about 260 m. w.s.w. from Timbuctoo.

BIS, in music, denotes that the passage over which it is placed is to be played twice, or repeated. Such passages generally have a slur or bow over them, and the word "bis" written below it, thus $\overset{\frown}{\text{Bis}}$.

BISAC'CIA, a t. of the Italian province of Avellino, situated on a hill about 30 m. e.n.e. of Avellino, with a population of about 6000. Numerous ancient remains discovered here appear to fix B. as the site of the old *Romulea*, captured by the Romans in the third Samnite war.

BISACQUI'NO, or BUSACCHI'NO, a t. of Sicily, about 27 m. s. of Palermo, with a population of 9120, who carry on an extensive trade in grain and oil.

BISCAY, or VIZCAYA, the most northerly of the Basque provinces (q.v.), is bounded n. by the Bay of Biscay; e. and s. by its sister-provinces, Guipuzcoa and Alava; and w. by Santander. It has an area of about 1300 sq.m., and a population, in 1870, of 187,926.

BISCAY, BAY OF, that portion of the Atlantic ocean which sweeps in along the northern shores of the Spanish peninsula in an almost straight line from cape Ortegal to St. Jean de Luz, at the western foot of the Pyrenees, and thence curves northward along the w. shores of France to the island of Ouessant. Its extreme width is about 400 m., and its length much about the same. The depth of water varies from 20 to 200 fathoms, being greatest along the n. shores of Spain. The whole of the s. coast is bold and rocky, in some places rising to a height of several hundred feet, and interspersed with short inlets, some of which form safe and commodious harbors. From the mouth of the Adour to the Gironde, the shore presents a totally different aspect, being low and sandy, with numerous lagoons, the embouchures of these two rivers forming the only harbors. For 200 m. n. the coast is still low, but marshy instead of sandy; and from the peninsula of Quiberon northward to Ouessant, it is moderately elevated and rocky in some places, with several good harbors. The rivers falling into the Bay of B. on the Spanish shores are unimportant, none of them having a course of more than 30 or 40 miles. On the coast of France, it receives, through the rivers Loire, Charente, Gironde, and Adour, the waters of half the surface of the whole country. Its chief ports are Gihon, Santander, Bilbao, San Sebastian, and Passages, in Spain; and Bayonne, Bordeaux, Rochefort, La Rochelle, and Nantes, in France. Its chief islands—which are all situated n. of the Gironde—are Belleisle, Ré, and Oléron. Navigation is rendered difficult and dangerous by the prevalence of n.w. winds (which drive in through the wide mouth of the bay large volumes of water from the Atlantic, to be again thrown back from the long regular line of coast towards the center, thus causing great commotion, and high, short, broken waves), and by the existence of a current—called Rennel's current—which sweeps in from the ocean round the n. coast of Spain,

along the w. and n.w. coast of France, then shooting across the British channel, brushes the Scilly isles, and after approaching the coast of Ireland, turns w. and s., till it joins the n. African current.

BISCE'GLIE, a seaport t. of Italy, on the Adriatic, in the province of Bari, in the former kingdom of Naples, 21 m. n.w.-by-w. from Bari. It is built on a rocky promontory, defended by strong fortifications. The fort admits only vessels of small burden. B. is a bishop's seat, and has a cathedral, besides two collegiate and several other churches, convents, a seminary, a hospital, etc. Rain-water is collected in public reservoirs, the water-supply being otherwise very insufficient. Pop. '72, 21,371. Around the town are many fine villas and country-houses. The neighborhood produces good wine, and has acquired particular celebrity for its currants, which are said to be equal to those of the Ionian islands. During the crusades, B. was famous for its hospital, founded by Bohemond, for pilgrims from the holy land, of which some ruins still exist.

BIS'CHOF, KARL GUSTAV, a distinguished chemist and geologist, was b. at Nürnberg (1792), and became professor of chemistry at Bonn in 1822. Having obtained the prize of the scientific society of Holland for his treatise on internal terrestrial heat, he published in England, in connection with it, *Researches on the Internal Heat of the Globe* (Lond. 1841), which was followed by a number of papers on connected geological subjects. The results of his researches (1837–40) on inflammable gases in coal-mines, and on safety-lamps, appeared in the *Edinburgh New Philosophical Journal* and other periodicals. His chief work is his *Manual of Chemical and Physical Geology.* He died at Bonn in 1870.

BIS'CHOFF, THEOD. LUDW. WILH., anatomist and physiologist, was b. in Hanover, 1807; became professor of anatomy in Heidelberg in 1836. From Heidelberg he removed, in 1843, to the university of Giessen, and in 1854 to that of Munich. He has devoted himself especially to embryology, to which he has made many contributions. His *Entwickelungsgeschichte des Kaninchencies* (Bruns. 1843) received the prize from the Berlin academy. Of his numerous writings in Müller's *Archiv*, and published separately, may be singled out the *Beweis der von der Begattung unabhängigen periodischen Reifung und Loslösung der Eier der Säugethiere und der Menschen* (Giess. 1844), in which he establishes the important doctrine of the periodic ripening and detachment of the ova in mammalia and man, independently of generation. Being called upon, in 1850, along with Liebig, to give his opinion in the famous Görlitz process (q.v.), which involved the question of the possibility of spontaneous combustion, he took occasion to give a dissertation *Uber die Selbstverbrennung* (on Spontaneous Combustion), demonstrating its impossibility, which is published in Henke's *Annals of Legal Medicine* (1850).

BIS'CHWEILER, a German t. situated on the Moder, about 14 m. n. of Strasburg. B. was formerly fortified, but was dismantled in 1706. It has manufactures of earthen wares, coarse woolens, linens, and gloves, and a trade in beer, leather, and the agricultural produce of the district. Pop. '71, 9231.

BISCUIT, in pottery, is the term applied to porcelain and other earthenware after the first firing, and before it has received the glaze and embellishments. See PORCELAIN and POTTERY. In this condition, the ware is very porous, adheres to the tongue when placed upon it, and allows water very slowly to percolate through its pores. The unglazed bottles employed in cooling water are examples of biscuit-*ware.*

BISCUIT, MEAT, a preparation of the substance of meat combined with a certain quantity of flour, made into the form of biscuits, by which process the nutritive qualities of the meat are preserved for any length of time. One way of preparing these biscuits is as follows: Large pieces of beef are placed in a quantity of water sufficient to cover them, and are subjected to slow ebullition. The fat being skimmed off, evaporation is allowed to take place, until the liquid is about the consistency of syrup, when it is mixed with fine wheaten flour, rolled out to the thickness of ordinary ship-biscuit, cut into any shape required, baked, and dried in the ordinary manner. One pound of biscuit usually contains the soluble part of 5 lbs. of meat and half a pound of flour. The meat-biscuits can be eaten like ordinary biscuits; but boiled in about twenty times their own weight of water for half an hour, with the usual condiments, they make excellent soup, and for this they were chiefly intended. Meat-biscuits were first introduced into Britain from America by Mr. Borden, in the year 1851. They have been spoken highly of by medical men as food, and are still made to a limited extent; but one purpose they were first intended to serve—that of preserving the animal food of South America and Australia—has since been more effectually done by other means. See PRESERVED PROVISIONS.

BISCUITS (Fr., twice-baked), small, flat bread, rendered dry and hard by baking, in order to their long preservation. They are divided into two classes—the *unfermented* and the *fermented. Unfermented* or *unleavened* B., generally known as *common sea-biscuits* or *ship-bread*, are made of wheaten-flour (retaining some of the bran), water, and common salt. The materials are kneaded together, either by manual labor—that is, by the hands and feet of the workmen—or by introducing the materials into a long trough or box, with a central shaft, to which a series of knives is attached, and which is made to revolve rapidly by machinery. The mass of dough so obtained is then kneaded and thinned out into a sheet the proper thickness of the B., by being passed and repassed

between heavy rollers. This sheet being placed below a roller with knife-edge shapes, is readily cut into hexagonal (six-sided) or round pieces of dough of the required size of the biscuits. The indentation of the slabs of dough, in the case of the hexagonal B., is not complete, so that all the B. cut out of each slab remain slightly adhering together. These slabs of B. are then introduced into an oven for about 15 minutes, and are placed in a warm room for 2 or 3 days to become thoroughly dry. The more modern oven is open at both ends, and the B. being placed in a frame-work, are drawn by chains through the oven. So rapidly is this operation conducted, that about 2000 lbs. weight of B. are passed through one of these ovens every day of ten hours.

Captains' B. are prepared from wheaten-flour, water, with common salt, and butter, with an occasional small dose of yeast to cause partial fermentation. Milk is also sometimes employed. *Water or hard B.* are made of flour, water, with variable quantities of butter, eggs, spices, and sugar. *Soft B.* contain increased quantities of butter and sugar. *Yeast B.* are those the dough of which is mixed with a small quantity of yeast, yielding more porous biscuits. *Buttered B.* are made with much butter and a little yeast. Other varieties of B. are named in the following table, which gives the materials added to the sack of flour, 280 lbs. in weight:

	Water or milk. quarts.	Butter. lbs.	Sugar. lbs.	Flavoring. Caraway seeds. in ozs.	Eggs.
Captains'	10	15	..	..	..
Abernethy	8¾	17½	17½	17½	..
Machine	5¾	58	14	..	..
American	10	40	..	..	..
Jamaica	8¾	17½	17½	..	..
Coffee	8¾	17½	..	..	140

Great care must be taken in the manipulative part of the process to incorporate the ingredients in a systematic manner. Thus, the butter is mixed with the flour in a dry condition, and then the water or milk added; and when eggs are used, they are thoroughly beaten up with water, and the sugar (if the latter is required) and the egg-paste added to the dough, which has been previously prepared with butter, or without butter. The various kinds of B. in the preparation of which yeast is employed, present a more spongy aspect than the unyeasted biscuits. Occasionally a little sesquicarbonate of ammonia (volatile salt) is added, to assist in raising the dough, and make a lighter biscuit. There are three principal varieties of the yeast or fermented B., and the following table gives the ingredients used in their manufacture from a sack of flour, or 280 lbs.:

	Water or milk. gals.	Dried yeast. lbs.	Butter. lbs.	Sugar. lbs.
Oliver	10½	4½	35	..
Reading	..	4½ to 5	25 to 30	
Cheltenham	10½	....	....	5

Soft or spiced B. are prepared from flour, with much sugar, a great many eggs, some butter, and a small quantity of spices and essences. The eggs tend to give a nice yellow cream-color to the B., which is occasionally imitated by the admixture of a chromate of lead (*chrome yellow*); but this is dangerous, and has given rise to several cases of poisoning. Several of the soft or spiced B. are referred to in the following table, a sack, or 280 lbs., being the amount of flour employed in each instance:

	Eggs.	Sugar. lbs.	Butter. lbs.	Flavor.
Tunbridge cakes	930	140	23	Orange flower, Water currants, Citrons and caraways.
Shrewsbury	93	93	93	Volatile salt, Cinnamon, Nutmeg or mace.
Ginger wafers	600	112	112	Ginger.
Victoria	750	70	80	Essence of lemon.

The extent to which B. are now consumed may be learned from the fact, that several of the largest biscuit-manufactories each prepare and throw into market every week from 30,000 to 50,000 lbs. weight of B. of various kinds. One of the largest and most complete biscuit-manufactories in England is that of Carr at Carlisle, whose biscuits, sold in tin-boxes, are well-known. Another bakery of this kind is that of Harrison of Liverpool.

BISE'GLIE, a fortified t. of Italy, in the province of Bari. It is built on a promontory in the Adriatic, about 21 m. w.n.w. of Bari, the district around being studded with handsome villas and country-houses, and famous for its production of currants, which are considered equal to those of the Ionian islands. The vine and olive are also cultivated in the neighborhood. B. has a cathedral, numerous churches, two monasteries, a hospital, an ecclesiastical college, etc., with the ruins of a hospital founded by Bohemond for pilgrims from the Holy Land, and celebrated during the crusades. Pop. '72, 21,371.

BISHAREEN', nomadic tribes living between the Red sea and the Nile; professed Mohammedans but almost uncivilized, without firearms, and accustomed to robbing. They possess camels, goats, horses, and sheep, and are nominally subject to the viceroy of Egypt.

BISHOP, the title of the highest order of clergy in the Christian church. The name is in the Saxon, *biscop*, and is from the Greek, *episcopos*, an overseer. The Athenians used to send officers called *episcopoi* to their subject states. The word was adopted by the Romans; and Cicero speaks of himself as an *episcopus* in Campania; it was also applied by them to the officers who inspected the provision-markets. There are two theories as to the functions of a B. in the primitive church, which may be described as the Episcopalian and the Presbyterian theories.

According to the former, the first bishops in the Church of Christ were his apostles; "for the office whereunto Matthias was chosen is termed (Acts i. 20) *episcope*—i.e, an episcopal office, which being spoken expressly of one, agreeth no less unto them all; and therefore St. Cyprian, speaking generally of them all, calls them *bishops*." The form of government at first established by the apostles was that the laity or people should be subject to a college of ecclesiastical persons appointed for that purpose in every city. These, in their writings, they term sometimes "presbyters," sometimes "bishops." Thus St. Paul to the elders at Ephesus says: "Take heed to the flock over which the Holy Ghost hath made you *overseers*"—i.e., bishops. This explains the Presbyterian view of the office. But as the apostles could not themselves be present in all churches, and as in a short time strifes and contentions arose, they appointed, after the order began at Jerusalem, some one president or governor over the rest, who had his authority established a long time before that settled difference of name took place whereby such alone were called bishops; and therefore, in the book of Revelation, we find that they are entitled "angels." St. Irenæus, martyred in the 2d c., says: "We are able to number up them who by the apostles were made bishops." In Rome he tells us, they appointed Linus; and in Smyrna, Polycarp. St. Ignatius witnesses that they made Evodius B. of Antioch. St. Jerome says: "All bishops are the apostles' successors;" and St. Cyprian terms bishops "*præpositos qui apostolis vicaria ordinatione succedunt*" (presidents who succeed to the apostles by vicarious ordination). Hooker says, in his usual judicious manner: "Such as deny apostles to have any successors at all in the office of their apostleship, may hold that opinion without contradiction to this of ours, if they will explain themselves in declaring what truly and properly apostleship is. In some things, every presbyter, in some things only bishops, in some things neither the one nor the other, are the apostles' successors." And he adds, what fairly states the Episcopal theory on this subject: "The apostles have now their true successors, if not in the largeness, surely in the kind of that episcopal function whereby they had power to sit as spiritual ordinary judges, both over laity and over clergy, where churches Christian were established." We find, also, that throughout those cities where the apostles did plant Christianity, history has noted a succession of pastors in the seat of *one*, not of many; and the first one in every rank we find to have been, if not some apostle, yet some apostle's disciple. By Epiphanius, the bishops of Jerusalem are reckoned down from St. James to his own time; and Tertullian, writing in the 2d c., has the following: "Let them show the beginnings of their churches, let them recite their bishops one by one, each in such sort succeeding other that the first B. of them have had for his author and predecessor some apostle, or at least some apostolical person who persevered with the apostles; for so apostolical churches are wont to bring forth the evidence of their estates." The judgment of the church of England as to the primitive existence of bishops is to be found in the preface to the ordination service, drawn up in the reign of Edward V., where it is said: "It is evident unto all men diligently reading the Holy Scripture and ancient authors, that from the apostles' time there have been these orders of ministers in Christ's church—bishops, priests, and deacons.

According to the other or Presbyterian theory of bishops, the origin and general history of the institution are thus sketched. In the earliest churches, no traces of a hierarchy, it is affirmed, are to be found. The superintendents or directors appointed over the first churches by the apostles, or chosen by the members of the congregations, were unquestionably styled indifferently presbyters or bishops—the former title being borrowed from the Jewish synagogue, the superintendent or director of which was called the elder (Gr. *presbyter*); the latter (*episcopos*) being familiar to the heathen converts as the title of a civil office corresponding in function to that of a Christian pastor. But this original equality did not last long. As new churches multiplied, those formed round the original church, though each having its own bishop or presbyter, remained in confederacy; and in the meetings of the pastors to regulate the common affairs, one must of necessity preside, most likely determined by age, superior piety, or other qualification. From this simple circumstance, as is indicated by Clemens Alexandrinus in the beginning of the 3d c., sprang the habit of looking upon one of the bishops as superior to the others; and this superiority, at first personal and accidental, soon came naturally to be regarded as attached to the B. of a particular congregation. In his case the word B. came to signify an overseer of pastors rather than an overseer of people. The monarchical form of state government favored this tendency, and con-

verted the president of a presbytery into the privileged superintendent of his brother-pastors. The assumption was resisted by the presbyters at first, but from the middle of the 5th c., episcopacy, or the domination of bishops, continued to gain the upper hand over presbyterianism, or equality of all pastors.

In the 3d c. bishops appear still dependent on the advice of their presbyters, and the consent of the people, and shared with the former the office of teaching and the cure of souls. As yet their exclusive privileges or functions were limited to confirmation, ordination of ministers, consecration of sacred things, settlement of secular differences among Christians, and management of the revenues of the church. But the tendency to subordination and unity did not rest here. Among the bishops, at first all equal, those of the larger and more important cities began gradually to acquire a superiority over those of inferior cities. When Christianity was made the religion of the Roman empire, the bishops became more and more monarchical, and put themselves on the footing of ecclesiastical princes. The chief cities of the larger civil provinces rose to be seats of extensive dioceses, the bishops of these assuming the distinctive titles of *patriarch*, *metropolitan*, *papa*—titles of courtesy that had long been applied to all bishops; while the less important provinces, with their capitals and bishops, became subordinate. Among these provincial bishops, again, three, from obvious causes, acquired a prominence that cast all the rest into the background—namely, Alexandria, Constantinople, and Rome. The beginnings of the ascendency of the Roman B. are discernible as early as the end of the 2d century. While ancient Rome sought her secular dominion more in the s. and e., modern ecclesiastical Rome turned herself chiefly to the nations of the w. and n.; and round the B. of Rome has grown a power—the Roman Catholic church—not less important than that of imperial Rome.

In the Roman Catholic church, the episcopal office is the foundation of the whole system. Christ's apostles are held to have transferred their functions to the episcopacy as a body. Every B., therefore, exercises within his own diocese, first, the *jus magisterii*—i.e., the right of maintaining and propagating the orthodox faith; and second, the *jus ordinis*, or regulation of the sacred and mysterious rites of the priestly office, some of which are transferred to the inferior clergy, as *jura communia*, while others remain the privileges of the bishop (*jura propria*). Among episcopal prerogatives, in addition to those already mentioned as assigned to them in the 3d and 4th c., are anointing of kings, consecration of abbots, preparation of the chrisma, etc. They have also the management of the church-property in their respective dioceses, and the oversight of all ecclesiastical institutions. Election to the office of B. rests generally with the presbyters of the diocese assembled in chapter, with the sanction of the secular power and of the pope. This is the case in Prussia. Where the sovereign is a Catholic, the appointment is mostly made by him, but subject to papal approbation. At consecration, which requires the presence of three bishops, the new B. takes an oath to the sovereign and to the pope, and signs the articles of belief, on which he receives the episcopal insignia—the miter (q.v.); crosier (q.v.) or staff; a gold ring, emblematic of his marriage to the church; the cross upon the breast; the dalmatica (q.v.), tunic, pallium (q.v.), and peculiar gloves and chaussure; and being enthroned, as formal installation into office, he then pronounces the blessing on the assembled people. In the discharge of his office, the B. has a number of subordinate assistants; sometimes, in case of age or weakness, a coadjutor, but ordinarily deans, archdeacons, etc. (q.v.)

In the Greek church, the office of B. is essentially the same, though less influential. Greek bishops, however, are always chosen from the monkish orders, and generally from the archimandrites—i.e., abbots or priors.

As Protestantism met with its chief resistance from the bishops, and, besides, laid the chief stress on doctrine rather than on church order, the episcopal order, in most of the reformed churches, either disappeared or sank into comparative insignificance. Of the continental Protestant churches, episcopacy has kept the foremost hold in Sweden and Norway. The Scandinavian bishops acceded to the reformation in 1531 only on compulsion from Gustavus Vasa, who confirmed them in their revenues and prerogatives. The B. of Upsala is primate, and has the prerogative of crowning the king, consecrating the other bishops, etc. The bishops are named by the king out of three proposed by the chapters. They preside in consistories, hold synods, visit the churches, examine and ordain ministers, consecrate churches, and watch over purity of doctrine and the property of the church. They have seats in parliament, and wear the pallium, miter, crosier, and cross. There are only six bishops in Sweden and Norway, with an additional B. of the order of the seraphim.

In Denmark, the Catholic bishops opposed the reformation, and were (1536) deposed by Christian III., and their extensive possessions confiscated. The king appointed in their stead a general superintendent and 9 Protestant bishops, with a fixed stipend. They are under the secular government, and have very limited authority over the clergy under their charge. The first in rank is the B. of Seeland.

In Protestant Germany, the episcopal dignity and rights passed into the hands of the secular sovereigns, who, down to quite recent times, assumed the title of supreme bishops, and exercised the prerogatives of such. Where the sovereign, as in Saxony, was of a different confession from the majority of his subjects, the episcopal authority

was delegated to a minister. The bishoprics, however, were gradually secularized, and with the nominal or titular bishops of Osnabrück and Lubeck (1803) the old episcopal dignities became almost extinct on the Protestant soil of Germany. The Lutheran church, however, never formally abolished the office of B., and Melanchthon endeavored to get it expressly recognized. In Prussia, accordingly, the title of B. has had a fluctuating fate. The bishops in office at the time having acceded to the reformation in 1525, were continued; but in 1554 the revenues were confiscated, and the duties assigned to superintendents. In 1587, this last remnant of the episcopal office also disappeared; till Frederick I. conferred the title of B. on two of his court-preachers on occasion of his coronation. At their death it again ceased, and was not revived until at the peace-festival in 1816 Frederick William III. raised two clergymen to the dignity of bishops. One of them, the B. of Königsberg, received in 1829 the title of evangelical archbishop. Several have since received the title of B , along with that of superintendent-general, entitling them to the first place in the consistories, a certain civil rank, insignia, and salary. Of the other German states, only Nassau followed the example of Prussia, by naming in 1818 a B. for the united evangelical churches of the duchy. Elsewhere, the episcopal authority, mostly in very limited form, is exercised by consistories, ministries of worship, superintendents-general, inspectors, etc.

In the church of Scotland, and other Presbyterian churches on the Geneva model, the episcopal office is not recognized. Roman Catholic Scotland was divided into eleven dioceses or bishoprics.

In none of the Protestant countries have the prerogatives and revenues of bishops remained so little impaired as in England, where the reformation was taken into his own hands by the king, and being propagated from above downwards, was effected in a very conservative spirit. Episcopacy was abolished about the time of the commonwealth, but at the restoration the bishops were restored, and have since retained their position in church and state.

The practice and history of the church of England in the matter of bishops may be given somewhat more in detail. The B. is the head of the clergy in his diocese; he ordains them, whereby he calls them into existence as ecclesiastical persons; he institutes them to benefices, and licenses them to cures, and to preach; visits them, and superintends their morals; and enforces discipline, for which purpose he has several courts under him, and can suspend or deprive them for due cause.

Over the laity he exercises a general pastoral authority, but they are more particularly brought under his notice at the time of their confirmation. The style, title, and privileges of the B. are inferior to those of the archbishop (q.v.). He is said to be *installed* in his bishopric; he writes himself, "by divine permission;" and has the title of lord, and right rev. father in God; and he may retain six chaplains. A bishop must be at least 30 years of age; the reason for which is, that Christ began his ministry at that age. For many centuries after the Christian era, the B. received all the profits of his diocese, and paid salaries to such as officiated under him. The mode of election, confirmation, and consecration is the same in the case of bishops and archbishops, for each archbishop is also B. and has his own diocese. The B. is elected by the chapter of his cathedral church by virtue of license from the crown. The laity used to take part in the election, but from the tumults that arose, the different sovereigns of Europe took the appointment, in some degree, into their own hands by reserving to themselves the right of confirming these elections, and of granting investiture to the temporalities which now began to be annexed to these dignities. This right was acknowledged in the emperor Charlemagne by pope Hadrian I., 773 A.D., and the council of Lateran. The right of appointing to bishoprics is said to have been in the crown of England even in Saxon times. But when, by length of time, the custom of electing by the clergy only was fully established, the popes began to object to the usual method of granting these investitures, which was *per annulum et baculum*—i.e., by the prince delivering to the prelate a ring and pastoral staff or crosier. In the 11th c., pope Gregory VII. published a bull of excommunication against all princes who should dare to confer investitures. There were long and eager contests occasioned by this papal claim, but at length the matter was compromised, the emperor Henry V. agreeing to confer investiture for the future *per sceptrum;* and the kings of France and England consented to receive only the homage for the temporalities, instead of investing them by the ring and crosier, the pope keeping in his hands the power of confirmation and consecration. This concession was obtained from Henry I.; but king John, in order to obtain the pope's protection against his barons, gave up, by a charter to all monasteries and cathedrals, the free right of electing their prelates. This grant was confirmed in Magna Charta, and was again confirmed by statute 25 Edward III. But by statute 25 Henry VIII., the ancient right of nomination was in effect restored to the crown. The sovereign, on the vacancy being notified, sends to the dean and chapter a letter missive, or *congé d'élire*, containing the name of the person to be elected; and if they do not elect in the manner appointed by the act, or if the archbishop or B. appointed for the purpose refuse to confirm, invest, and consecrate the B. elect, the recusants incur the penalty of a *præmunire* (q.v.). A bishop is not consecrated more than once, and he cannot be *deposed*, as it is supposed that the order itself cannot

absolutely be taken from him; he may, however, be *deprived*, as was done to the B. of Clogher in 1822; he may also resign his see; and he may be removed from one see to another, which is called *translation;* but this practice is now less frequent than it used to be. The dean and chapter of Canterbury claim it as an ancient right of that church, that every B. of the province is to be consecrated in it, or the archbishop to receive from them a license to consecrate elsewhere; and it is said that a long succession of licenses to that purpose are regularly entered in the registry of that church. When elected and confirmed, a B. may exercise all spiritual jurisdiction, but he is not completely B. until consecration. Bishops, upon their election, become peers of the realm, and are summoned to the parliament as well as the other nobles; but the right under which they sit there, whether in respect of their baronies, or by usage and custom, is a matter of uncertainty. It appears, however, that the bishops sat in the Wittenagemote, under the Saxon monarchs, as spiritual persons; for they were not barons until William the conqueror turned their possessions into baronies, and subjected them to the tenure of knights' service. The bishops created by Henry VIII.—viz., Bristol, Gloucester, Chester, Oxford, and Peterborough, as also the lately created bishops of Ripon and Manchester—sit in parliament, though they do not hold their lands by baronial tenure. The bishops withdraw from the house (under protest, however) when any capital charge is to be decided. The bishops sit in parliament next to the archbishop of York; first, London; second, Durham; third, Winchester; and then the rest according to their ancienties. In respect of their persons, bishops are not peers with the nobility; and in cases of alleged crimes, they are tried by a jury in the same manner as commoners, as was the case with Cranmer and Fisher. When a see is vacant, the archbishop of the province is guardian of the spiritualities; but he cannot as such consecrate or ordain or present to vacant benefices. The sovereign has custody of the lay-revenues during a vacancy. Queen Elizabeth kept the see of Ely vacant 19 years.

All the bishops of a province, with respect to their archbishop, are called his suffragans; but originally this term denoted the bishops who were consecrated to assist and help the other bishops, and to supply their places when absent. They were also called *chorepiscopi*, or bishops of the country.

The B. of Durham had formerly a *palatine* jurisdiction, as it was called in the county of Durham; and the B. of Ely had a similar secular authority in certain places; but these powers were transferred to the crown in 1836. The houses of bishops are called their palaces. In old times their palaces in London were extra-diocesan; and while residing there, they exercised jurisdiction in the same manner as in their own dioceses. This personal privilege is now extinct in the bishops; but Lambert house, Croydon, Winchester place, and Ely house retain the privilege. A bishop makes a triennial visitation of his diocese.

The conferring of orders rests, in a great measure, with the discretion of the bishop. He can refuse to ordain without giving any reason, but he can ordain no person who does not subscribe to the queen's supremacy, the book of Common Prayer, and the 39 articles. A candidate for orders must be first examined and approved; and the person to whom the right of performing this duty belongs, is by the canon law the archdeacon of the diocese. A B. may give letters dimissory to another B., licensing the latter to ordain a candidate. No person under 23 can be ordained deacon, and none can be ordained priest under 24 years of age. See ORDINATION.

In England, there are 30 bishops, including the two metropolitans—viz., Canterbury, York, London, Durham, Winchester, Bangor, Rochester, Exeter, Peterborough, St. David's, Worcester, Chichester, Lichfield, Ely, Oxford, St. Asaph, Manchester, Hereford, Chester, Llandaff, Lincoln, Salisbury, Bath and Wells, Carlisle, Gloucester and Bristol, Ripon, Norwich, Sodor and Man, Truro, St. Albans. Two of these, the B. of Sodor and Man, and the junior of the rest (provided he be not an archbishop, or bishop of London, Durham, or Winchester), have no seat in parliament.

In Ireland, there are 12, including the two metropolitans, whose sees stand first—viz., Armagh and Clogher, Dublin and Kildare, Meath, Killaloe, Kilfenora, Clonfert and Kilmacduagh, Tuam, Killala, and Achonry; Ossory, Ferns, and Leighlin; Cashel, Emly, Waterford, and Lismore; Down, Connor, and Dromore; Derry and Raphoe, Limerick, Ardfert, and Aghadoe; Kilmore, Elphin, and Ardagh; Cork, Cloyne, and Ross.

In British North America, there are 10 sees; in the West Indies, 4; in South America, 1; in Africa, 6; in Asia, 6; in Australasia, 12; and in Europe, 1—that of Gibraltar; besides missionary bishops and the B. at Jerusalem. There are 7 bishops of the Episcopal church in Scotland. In the United States, there are 39 bishops of the Protestant Episcopal church.

There are an archbishopric and 13 Roman Catholic bishops in England. In Ireland there are 4 Catholic archbishops and 28 bishops. The Roman Catholic hierarchy in Scotland was formally restored in 1878, and has 2 archbishops and 4 bishops. The assumption of territorial titles by Roman Catholic bishops in England and Scotland is illegal, but they are, nevertheless, commonly ascribed to them by members of that communion. See Hooker's *Ecclesiastical Polity*, Burn's *Ecclesiastical Law*, Cripp's *Laws of the Church*, and *Blackstone*. See also ARCHBISHOP.

BISHOP (*ante*). In the Protestant Episcopal church in the United States, the functions of bishops, in religious matters, are similar to those of English prelates. In political affairs they have, of course, no official power. They are chosen to office by the convention of clerical and lay delegates in the diocese over which they are to preside; and are consecrated by the house of bishops, according to rules established by the general convention, which consists of the house of bishops and a second house of clerical and lay delegates from all the dioceses. There are 61 diocesan and missionary bishops. In the Methodist Episcopal church, the bishops are elected by the general conference. Their duties are those included in a general superintendence of the whole church. Authority is vested in them all, and its administration is distributed among themselves by mutual agreement. They preside over meetings of the annual conferences, ordain ministers, and appoint them to their fields of labor. The oldest in office is honored as "senior bishop."

In the Roman Catholic church in the United States, bishops are appointed by the pope, as in other countries, and are subject to him.

BISHOP, a favorite beverage composed of red wine (claret, Burgundy, etc.) poured warm or cold upon ripe bitter oranges, sugared and spiced to taste, and drunk either hot or cold. The quality of the B. depends upon the excellence of the wine employed in its preparation. The oranges must be carefully selected, and the white part between the peel and pulp must be thrown away. If white wine be used, the beverage is called *cardinal;* and with Tokay it becomes *pope.* Taken in moderation, B. is a wholesome drink; but if partaken of too freely, the ethereal oil contained in the orange-peel is apt to occasion headache. The beverage was known under other names in Germany during the middle ages, having been imported into that country from France and Italy; its present name seems to have been bestowed during the 17th century.

BISHOP, Boy. See Boy Bishop.

BISHOP, Anna, wife of the composer, sir Henry Rowley, B., and herself an eminent operatic and classical singer. Her first appearance was in 1837, and she soon became widely known in Europe and America. In 1858, she married Mr. M. Schultz, of New York.

BISHOP-AUCKLAND, a t. in England, 11 m. s.w. of the city of Durham, on an eminence near the confluence of the Wear and Gaunless; well paved, lighted, and watered. The palace of the bishop of Durham, at the n.e. end of the town, is a spacious and splendid though irregular structure. The site was chosen in the time of Edward I. by bishop Anthony Beck. The present buildings cover five acres, and there is a park attached of 800 acres. The industries of the town are cotton manufactures and engineering. Pop. '71, 8736.

BISHOP, Sir Henry Rowley, an eminent English composer of music, was b. in London in 1780. His principal musical instructor was Signor Francisco Bianchi, an opera composer settled in London. In 1806 B. was appointed composer of ballet music at the opera. His most popular operatic entertainments were *Guy Mannering; The Slave; The Miller and his Men; Maid Marian; Native Land; The Virgin of the Sun;* etc.—all remarkable for their long flowing melodies, animated style, and true musical power. From 1810 to 1824, he was director of the music at Covent garden theater. One of the first directors of the philharmonic society, he for many years conducted the concerts of ancient music. He arranged several volumes of the *National Melodies,* and succeeded sir John Stevenson as arranger of the airs selected by Moore for his *Melodies.* In June, 1839, he received the degree of bachelor of music from the university of Oxford, and in Nov., 1841, was elected Reid professor of music in the university of Edinburgh. In 1842, he was knighted. In Dec., 1843, he resigned his Edinburgh chair, and in Feb., 1848, was elected professor of music in the university of Oxford. In his later years he was in very necessitous circumstances. He died April 30, 1855.

BISHOP'S CASTLE, a t. in the s.w. of Shropshire, 19 m. s.w. of Shrewsbury. It is irregularly built on a hill slope. Pop. '71, 2091. The bishops of Hereford had formerly a castle here, now destroyed. During the civil wars of the 17th c., the inhabitants took shelter in the church, which was demolished over their heads.

BISHOP'S STOREFORD, a t. of Hertfordshire, on the Stort, 10 m. e.n.e. of Hertford. It chiefly consists of two streets in the form of a cross. It carries on a trade in grain and malt, and has several tan-yards. B. S. was in Saxon times the property of the bishops of London. Pop. '71, 6250.

BISHOP'S WALTHAM, a t. of Hampshire, about 10 m. e.n.e. of Southampton. Pop. of parish (1871), 1939. Corn, leather, and malt form the chief trade of the town. It has been immemorially the property of the see of Winchester. There are the remains of a bishop's castle, built in 1135 by Henry de Bloisking, king Stephen's brother, and which was reduced to ruins during the civil wars of the 17th century. A gang of "Waltham Blacks," or deer-stealers, infested the forest in this vicinity in the early part of the 18th century. The *Black Act* (q.v.) was passed in 1723, to put them down.

BISIGNA'NO, a t. of Italy, in the province of Cosenza, is situated on a hill near the junction of the Mucone with the Crati, about 15 m. n. of the town of Cosenza. It has a

cathedral, a castle, and a trade in silk, and gives the title of prince to the existing branch of the Sanseverino family. Pop. 4096.

BIS'KARA, or BISKRA, a t. in Algeria, and the most important military post of the Sahara, on the s. side of the Aures mountains. A large caravan trade between the Sahara and the Tell passes through the town. Iron, limestone, and saltpeter are found; dates are abundant; and there are manufactures of carpets. Near by is an acclimatization garden, established by the French. Pop. '72, 7867.

BIS'LEY, a t. of Gloucestershire, 11 m. s.e. of Gloucester. Pop. of parish (1871), 4985. The chief manufacture is coarse clothing. The church contains some interesting monuments, a cross-legged knight in armor, and an ancient stone font. There is also an ancient octagonal stone cross in the church-yard. The canal uniting the Severn and the Thames passes through the parish, the highest part being 370 ft. above sea-level.

BISMARCK-SCHOENHAUSEN, OTTO EDUARD LEOPOLD, Prince von, chancellor of the German empire, now the most prominent man in Europe, was b. in 1813 at Brandenburg, of an old family, of which various members have gained a reputation both as soldiers and statesman. B. received his university education at Göttingen, Berlin, and Greifswald, where he studied law. After he had finished his studies, he lived for a time on his estates. Before 1847, he was little heard of, but about that time he began to attract attention in the Prussian parliament as an ultra-royalist, and an advocate of the extremest absolutism. He was one of those who opposed the scheme of a German empire, proposed by the German parliament of 1849. His diplomatic career commenced in 1851, when he was appointed chief secretary of the Prussian legation, at the resuscitated German diet at Frankfort. Here he began to manifest that zeal for the interests and aggrandizement of Prussia, which has since undeviatingly guided him, often regardless of the means. In the diet, he gave open expression to the long-felt discontent with the predominance of Austria, and demanded equal rights for Prussia. In St. Petersburg, whither he was sent in 1859, he is said to have tried to bring about an alliance between France, Prussia, and Russia, but without success. By this time he had acquired the special regard and confidence of the king, who sent him, in the spring of 1862, as ambassador to Paris, in order to give him an insight into the politics of the Tuileries, before taking the direction of affairs at home. In autumn, when the king's government could not obtain the consent of the lower house to the new military organization, B. was recalled, to take the portfolio of the ministry for foreign affairs, and the presidency of the cabinet. Not being able to pass the reorganization bill and the budget, he closed the chambers (Oct., 1862), announcing to the deputies that the king's government would be obliged to do without their sanction. Accordingly, the army reorganization went on; and the next four sessions of parliament were closed or dissolved in the same way, without the government obtaining, or even caring to obtain, the sanction of the house. The people were now looking for a *coup d'état*, and the government for a revolution. At this crisis, the death of the king of Denmark opened up again the Slesvig-Holstein question, and excited a fever of national German feeling, which B. was adroit enough to work so as to aggrandize Prussia by the acquisition of the duchies, and reconcile his opponents to his high-handed policy by being able to point to the success of the newly-modeled army. Throughout the events which ended in the humiliation of Austria and the reorganization of Germany under the leadership of Prussia (see GERMANY, in SUPP., Vol. X.), B. was the guiding spirit; and such is the magic of success, that, from being universally disliked, he has become the most popular man in Germany. What is perhaps still stranger, the man who, of all others living, has been the most strenuous upholder of absolutism, and has all along manifested the strongest contempt for public opinion, received, in 1871, the thanks and congratulations of the extreme democrats of Great Britain for giving to North Germany a constitution based on universal suffrage. It was B. that negotiated the neutralization of the Luxemburg territory (1867). The action of France in regard to the candidature of prince Leopold of Hohenzollern for the throne of Spain gave B. the opportunity of carrying into action the intensified feeling of unity amongt Germans. During the war of 1870–71, B. was the spokesman of Germany; he it was that, in Feb., 1871, dictated the terms of peace to France. He was soon created a prince and chancellor of the German empire. The most striking feature of his administration has been a contest with the Catholic church, in which the expulsion of the Jesuits (July, 1872), and the carrying out of the new ecclesiastical laws, were the most prominent events. His life was attempted in 1874. He presided at the Berlin congress of 1878. His recent financial schemes, including a tobacco monopoly and the extension of the protective system, have met with strong opposition from the national-liberal party. In social life, B. is genial and witty. The work *B. und seine Leute*, by Dr. Busch (1878), contains many facts and amusing incidents, throwing light on the chancellor's character and manners.

BISMUTH is a brittle metal of a crystalline texture, and of a white color tinged with a faint red hue. It is found native in Cornwall, Germany, France, and Sweden, where it occurs in veins or fissures passing through other rocks. The principal natural source is an impure metal; but it is likewise found in combination with oxygen, sulphur, and arsenic. The pure metal is generally obtained by heating the impure native B. in iron

tubes in a furnace, when the metal volatilizes, and the vapor, condensing into a liquid in a somewhat cool part of the tube, runs into a receiving-vessel, and is ultimately transferred to molds, where it solidifies with a crystalline texture. B. is represented by the chemist by the symbol Bi; has the atomic weight or equivalent of 213, and has the specific gravity of 9783 to 9833 (water=1000). The metal B. is seldom employed by itself in the arts. The alloys of B. are of considerable commercial importance. In combination with tin, B. forms an alloy possessing great sonorousness, and therefore suitable for bells. The alloy of 8 of B., 5 of lead, and 3 of tin, readily fuses at 202° F., and therefore melts in boiling water; and the alloy of 2 of B., 1 of lead, and 1 of tin, at 200.75° F. Either of the latter alloys is entitled to the term *fusible alloy*, and when mixed with some mercury, becomes still more fusible, and may then be used in forming molds for toilet-soaps, and in taking casts.

B. forms several compounds of service in the arts and in medicine; it combines with oxygen to form several oxides, of which the teroxide (BiO_3) is the most important. It may be prepared by evaporating the solution of the ternitrate of B. ($BiO_3,3NO_5$) to dryness, and then heating, when the nitric acid ($3NO_5$) escapes, and leaves the teroxide of B. (BiO_3) as a yellowish powder. It is employed in the porcelain manufacture as an agent for fixing the gilding, and for increasing the fusibility of fluxes, at the same time neutralizing the colors which are often communicated by them. The ternitrate of B. is prepared by acting upon the metal B. with a mixture of one part of commercial nitric acid and one part of water, and applying heat. The subnitrate or basic nitrate of B. receives the names of *Pearl White*, *Pearl Powder*, *Blanc de Fard*, *Blanc d'Espagne*, *Majestery of B.*, and *Perlweiss* and *Schminkweiss* (German). It is used as a cosmetic, but is apt to become gray in tint, and even brown or black, when sulphureted hydrogen, often evolved from sewers, cesspools, and drains, comes in contact with it.

The subnitrate of B., the only medicinal preparation formed from this metal, acts as a local irritant and caustic poison on animals. On man, when given in small doses, it acts locally as an astringent, diminishing secretion. On account of the frequent relief given by it in painful affections of the stomach, where there is no organic disease, but where sickness and vomiting take place, accompanied by cramp or nervous disorder, it is supposed to act on the nerves of this viscus as a sedative. It has also been denominated tonic and antispasmodic. Vogt says, that when used as a cosmetic, it has been known to produce a spasmodic trembling of the face, ending in paralysis.

BISON, a name given by the ancients to an animal of the same genus with the ox (q.v.), still called the B., or the European B. (*bos bison* of some naturalists, *bos urus* of others) also known as the aurochs (Germ., wild animal or wild ox). This animal at one time abounded in most parts of Europe, but is now found only in the forests of Moldavia, Wallachia, Lithuania, and Caucasus. Herds of bisons, carefully protected by the emperor of Russia, and believed to amount to about 800 in all, roam through the great forest of Bialowieza, in Lithuania. The B. differs from all varieties of the common ox, in the arched line of the back, which rises in a sudden elevation behind the neck; the hump which is formed not consisting, however, of mere fat, but in great part of the very thick and strong muscles which support the large head. It is remarkable for strength in the fore-parts, and trees of 5 or 6 in. in diameter cannot withstand the thrusts of old bulls. It is capable of repelling all the attacks of the wolf or bear, rushing upon, overthrowing, and then trampling an adversary. Its horns are short, tapering, very distant, spreading, a little curved inwards at the point. They are affixed not at the extremities of the most elevated salient line of the head, as in the ox, but considerably in front of it. The figure of the forehead differs also from that of the ox in its greater breadth, and in its convex profile. Another important anatomical difference is in the number of ribs, of which the B. has 14 pair, whilst the ox has only 13; and the vertebræ of the tail are fewer, being only 19 instead of 21. The hair of the forehead is long and shaggy; that under the chin and on the breast forms a sort of beard: and in winter the neck, hump, and shoulders are covered with long woolly hair, of a dusky brown color, intermingled with a short, soft, fawn-colored fur. This long hair is gradually cast in summer. The legs, back, and hinder-parts are covered with short dark-brown hair. The tail terminates in a large tuft. The females are not so large as the males, nor do they exhibit the same shagginess of the fore-parts. The B. is the largest quadruped now existing in Europe, although within the historic period there appears to have existed along with it an ox exceeding it in size; and it appears to have been this ox, and not the B., which was called *urus* (q.v.) by the ancients, although their *bonasus* (or *bonassus*) was probably the same with the bison.—The food of the B. consists of grass and brushwood, and the leaves and bark of young trees. Its cry is peculiar, "resembling a groan or a grunt, more than the lowing of an ox." It does not attain its full stature till after its sixth year, and lives for about 30 or 40 years. The period of gestation appears to be the same with that of the ox. The B. has never been reduced to subjection by man, and the domestication even of individuals taken young, has been very partial. It generally shows a great aversion to the domestic ox. The common statement, however, that the B. calf invariably refuses to be suckled by the domestic cow, is contradicted on the excellent authority of the master of the imperial forests in the Russian government of Grodno.—The B. is generally very shy, and can only be approached from the leeward,

its smell being very acute. It is easily provoked, and is not approached without danger. It runs very swiftly, although it cannot long continue its flight, galloping with its head very low, so that the hoofs are raised higher than the head.

There is no historical evidence that the B. ever existed in Britain; but remains of this, or of a very closely allied species, are found in pliocene fresh-water beds in several parts of England, as well as on the continent of Europe. The size of these B. bones is, however, so great as of itself to cause a doubt of the identity of the species, and the horns are longer in proportion. The fossil B. has been called *bison priscus; bison* being by some naturalists separated as a genus from *bos*, upon the ground chiefly of the osteological differences in the head.

The American B. (*bos Americanus* of some naturalists, *B. bison* of others) is interesting as the only species of the ox family indigenous to America, except the musk ox (q.v.) of the subarctic regions. It is commonly called *buffalo* by the Anglo-Americans, although it is very different from the buffaloes (q.v.) of the old world. It is found in vast numbers in the great prairies between the Mississippi and the Rocky mountains; it occurs as far n. as the vicinity of Great Marten lake, in lat. 63° or 64°; extensive level and marshy tracts there affording suitable food, although it is nowhere else to be met with in so high a latitude. Its southern limit appears to be in New Mexico. It is comparatively rare to the w. of the Rocky mountains, and appears to have been rare to the e. of the Appalachians, even on the first settlement of Europeans. Within the present century, however, it was found in the western parts of the state of New York, and in large numbers in that of Ohio; but it has now disappeared from the whole region e. of the Mississippi, and it is necessary to advance about 100 m. to the westward of that river before considerable numbers are anywhere to be found. In the western prairies enormous herds still congregate; great plains are sometimes spotted and darkened with them as far as the eye can reach; "countless thousands" are described as coming to refresh themselves in stagnant pools; and their paths are said to be, in some parts of the wilderness, as frequent and almost as conspicuous as the roads in the most populous parts of the United States.

About 300,000 Indians are supposed to subsist almost entirely on the flesh of the B. The spear and the bow and arrow are still much employed by them in hunting it, although many of them also use fire-arms. They frequently pursue it on horseback; but the hunter, whether on horseback or on foot, has often much difficulty in getting within shot, upon account of its keenness of scent, and the speed with which it runs. The chase of the B. is also very dangerous, as it is apt to turn upon an adversary, and even a fleet horse cannot always escape it. Great numbers, however, are sometimes killed when the hunters can succeed in throwing the herds that are scattered over the plains into confusion, so that they run wildly, without heeding whither. Another expedient of the Indians is to set fire to the grass of the prairies around them, when they retire in great consternation to the center, and are easily killed. A sort of pound or inclosure is sometimes made, with a long avenue leading to it, and an embankment of snow, such, that when the animals have descended over it they cannot return, and by this means great numbers are often captured and killed. Livingstone describes a similar expedient as in use for killing wild animals in South Africa. Sometimes, also, the Indians contrive to throw them into consternation, and to make them run towards a precipice, over which many of the foremost are driven by the crowds which throng up behind.

The American B. is very similar to the European. In general, it is of rather smaller size, but this does not appear to be always the case, and it is said sometimes to attain a weight of 2000 lbs. Its limbs and tail are shorter, and the tail consists of fewer vertebræ. The horns are shorter and more blunt. The fore-parts are still more shaggy, and retain more of their shagginess in summer. The ground upon which many naturalists have rested their chief confidence of specific difference has been, however, the presence of an additional pair of ribs, the American B. being said to have 15 pair; but Mr. Vasey has recently ascertained that, like the European B., it has only 14. The more gregarious habit may perhaps be accounted for, like that of the American beaver, by difference of circumstances.

The wolf is quite unable to contend with the B., but many wolves often hang around the herds, to devour calves which may stray, or aged animals which have become too weak to keep up with the rest. These have sometimes been seen assailed by whole packs of wolves, and dealing death to many of their assailants, before they were compelled to yield to numbers and hungry pertinacity. The only American animal that is singly capable of overcoming the B. is the grisly bear. See BEAR.

The flesh of the B. is very good, and differs from that of the ox in having a sort of venison flavor. The hump, in particular, is esteemed a delicacy.—*Pemmican* (q.v.), so much the food of fur-hunters and northern *voyageurs*, is made of the flesh and fat of the bison.—The tallow forms an important article of trade. One bull sometimes yields 150 lbs. The skins are much used by the Indians for blankets, and, when tanned, as coverings for their lodges and beds. A blanket of B.'s skin is not unfrequently sold for three or four pounds sterling in Canada, to be used as a traveling cloak or wrapper. The Mandan Indians make canoes of B. skins spread upon wicker-work frames. These canoes have the round form of the Welsh *coracle* (q.v.). The long hair or fleece is spun

and woven into cloth; and some of it which has been brought to England has been made into very fine cloth: stockings, gloves, etc., are also knitted of it. A male B. yields from 6 to 8 lbs. of this long hair.

The few attempts that have been made to domesticate the American B., have been so far successful, that they afford encouragement to further experiments. The size and strength of the animal make it probable that, if domesticated, it would be of great use.

BISSA'GOS, or BIJU'GA ISLANDS, a group of small volcanic islands, about 20 in all, off the w. coast of Africa, in lat 10° 2′ to 11° 42′ n., and long. 15° to 17° w., opposite the mouth of the Rio Grande. The islands are inclosed by a reef, and, with a few exceptions, are thickly wooded. Many of them appear to be densely peopled by a savage, thievish negro race, who cultivate maize, bananas, and palms, and feed cattle and goats, which constitute their chief wealth. There are several fine ports. On one of the islands, Bulama, the British formed a settlement in 1792, but were obliged to abandon it the following year, on account of its unhealthiness. Bissao, one of the group, on which there is a Portuguese settlement, has a pop. of 8000. It carries on a large trade in slaves, nearly all its European inhabitants being engaged in the traffic. It has also a trade in rice, wax, hides, etc., and imports annually about £20,000 worth of British manufactured goods.

BISSELL, WILLIAM H., 1811–60; a graduate from Jefferson medical college in 1835, who practiced in New York state. In 1837, he went to Illinois, and was in the legislature in 1840; afterwards studied law and became prosecuting attorney. He was a col. in the Mexican war; elected to congress in 1849, and while there had a sharp discussion with Jefferson Davis about the bravery of northern and southern soldiers, which provoked Davis to send him a challenge. B. accepted, chose muskets for the weapons, and prescribed a distance that would in all probability insure death for both. There was no duel, the challenge being withdrawn after some interference of friends. In 1856, he was chosen governor of the state.

BISSEN, WILHEM, a distinguished Danish sculptor of the present century was b. near Slesvig in 1798, and studied his art for 10 years in Rome, under the guidance of his countryman, Thorwaldsen. Returning home, he executed a number of excellent works (a bust of Oersted, Atalante hunting, etc.). In 1841, he returned to Rome, being commissioned by the government to make 18 statues larger than life. Along with these he produced a Venus, and a charming piece, "Cupid sharpening his Arrow." Being recalled to Copenhagen, he was commissioned to execute a frieze of several hundred feet long for the great hall of the palace, representing the development of the human race according to the Greek mythology. Thorwaldsen, in his will, appointed B. to complete his unfinished works and have charge of his museum. In 1850, he was made director of the academy of arts, Copenhagen. At the Paris exhibition in 1855, he was the only sculptor who represented Danish art. He died in 1868.

BISSEXTILE, the old name of leap year. In the Julian computation a day was added to February every fourth year, but instead of making it as now the 29th, the 24th day of the month was counted twice (*bis*), and as that day was the sixth (*sexto*) before the calends of Mar. it was called *bis-sextile*.

BISTORT, *Polygonum bistorta*, a perennial plant, 1 to 1½ ft. high, with a simple stem, ovate subcordate and wavy leaves, the radical leaves tapering into a long footstalk, and one dense terminal cylindrical spiked raceme of flesh-colored flowers. The root is about the thickness of the little finger, blackish brown externally, reddish within, and tortuous (whence the name bistort). The whole plant is astringent, containing much tannin; the root is one of the strongest vegetable astringents, and is much employed in medicine, both internally and externally, in hemorrhages and many other complaints. B. is a native of meadows in Europe, and is found in Britain, but is by no means common. See POLYGONUM.

BIS'TRE, or BIS'TER, is a pigment of a warm brown color, prepared from the soot of wood, especially beech. It is used in water-colors after the manner of Indian ink.

BISTRITZ, a fortified t. of Transylvania, beautifully situated on the Bistritz river, in a fine valley about 50 m. n.e. of Klausenburg. In its vicinity are the remains of an ancient castle, once the residence of the illustrious Hunyads. It has several large cattle-fairs, but the extensive general trade it once carried on is now entirely gone. Forming, as it does, the last strong position in the n.e. of Transylvania, it was repeatedly during 1848–49 the scene of hot strife between the Hungarian and Austrian generals. Pop. '69, 7212. B. is also the name of a river which, rising in e. Hungary, flows s.e. through Bukowina and Moldavia, and joins the Sereth near Baku, after a course of 110 m., and is called the Golden B., on account of the auriferous character of its sands.

BISULNUG'GUR, or BISANAGAR, a t. of India, in Guzerat, in the territories of Guicowar, 82 m. n.w. of Mhow. It has a large transit trade, and manufactures cotton cloths. Pop. 18,000.

BISULPUR', or BESULPORE, a t. of India, in the British district of Bareilly, n.w. provinces. It is 24 m. s.e. from Bareilly. It has a good bazaar, and is abundantly supplied with water. Pop. '71, 9005.

BIT, or BITT, in ship-building, is a frame composed chiefly of two short but strong vertical timbers, fixed into or upon the deck in the fore-part of the vessel. Its main purpose is for fastening the cable when the ship rides at anchor, and for "leading" the principal ropes of the rigging. To "bit the cable," is to fasten it around the bit. Various kinds are called "riding-bits," "Elliott's bits," "Carrick-bits," "paul-bits," "jeer-bits," "topsail-sheet-bits," etc. Having to resist great strains, the bits are strongly bolted to the beams that support the deck.

BITCHE, a German t. of Alsace-Lorraine, in a wild and wooded pass of the Vosges, about 16 m. e.s.e. of Sarreguemines. Its citadel, which is built on a precipitous and isolated rock, in the middle of the town, is well supplied with water, defended by 80 cannon, has accommodation for a garrison of 1000 men, and is considered all but impregnable. The Prussians under the duke of Brunswick attempted to surprise it in 1793, but failed. Pop. of town, 2456, who are engaged in the manufacture of matches, watch-glasses, and porcelain. The German spelling is *Bitsch*.

BITHOOR, a t. in India in the district of Cawnpore, and lieutenant-governorship of n.w. provinces, stands on the right bank of the Ganges, about 12 m. n.w. of Cawnpore itself. B., particularly devoted to the worship of Brahma, has numerous pagodas. It is, of course, a favorite resort for pilgrims, who here, as at Benares and Bindraban, have access to the sacred stream for purposes of ablution, by means of elaborately constructed ghauts. During the mutiny of 1857, B. acquired an unenviable notoriety as the stronghold of Nena Sahib. Here also Havelock more than once exacted retribution, however inadequate, defeating the Nena in the field, and burning his fort. B. in 1871 contained 8322 inhabitants.

BITHYNIA, an ancient division of Asia Minor, was separated from Europe by the Propontis (sea of Marmora) and the Thracian Bosporus (strait of Constantinople), and was bounded n. by the Euxine, and s. by Galatia, Phrygia, and Mysia. Its eastern limits were not very clearly defined, but they at least extended as far as Paphlagonia. It contained the famous Greek cities or colonies of Chalcedon, Heraclea, etc.; and at later periods, Nicomedia, Nicæa, and Prusa were flourishing cities of Bithynia. The inhabitants of B. were supposed to be of Thracian origin. The country was subdued (560 B.C.) by Crœsus of Lydia, and, five years later, fell under the Persian dominion. But about 440 or 430 B.C., it became an independent kingdom under a dynasty of native princes, who made Nicomedia their capital. The last king, Nicomedes III., made the Romans his heirs, and with a large addition from the Pontic kingdom, B. became a province of the empire (74 B.C.). Under Trajan, B. was governed by Pliny the Younger, whose letters to the emperor on the administration and condition of the province contain the well-known passage respecting the Christians. The emperor Diocletian made Nicomedia his habitual residence. In 1298, Osman the Turk broke into the country, and in 1328, Prusa or Brusa, then the chief town of B., became the capital of the kingdom of the Osmanli.

BITLIS, a t. of Asiatic Turkey, in the vilayet of Erzroum, in lat. 38° 24′ n., and long. 42° 5′ e., about 120 m. s.e. from Erzrum. It is situated at an elevation of 5156 ft. above the level of the sea, in a deep ravine traversed by the river Bitlis, one of the head streams of the Tigris. B. is a straggling, irregular place, covering a large surface of ground, and surrounded by bare limestone mountains, rising to a height of about 2000 ft. above the valley, which is filled with orchards and gardens, and watered by numerous streams and springs. It has 3 mosques, about 12 convents belonging to the howling dervishes, who appear to have made B. their head-quarters, several well-stocked bazaars, and extensive manufactures of cotton cloths, which are celebrated for their bright red dye. It has also a very extensive trade. The import of British goods is small. The population consists of about 2000 Mohammedan and 1000 Armenian families. The Persians defeated Solyman the Magnificent near B. in 1554.

BITONTO (ancient *Butuntum*), a t. of Italy, in the province of Bari, and 10 m. w.s.w. of the city of Bari. It is situated in a fruitful plain about 5 m. from the sea, is well built, is, conjointly with Ruvo, the see of a bishop, and has a fine cathedral, monasteries, and a nunnery. Pop. 23,000, who carry on an extensive trade in a wine called *Zagarello*, which is largely cultivated in the environs. B. is the birthplace of Giordani, the mathematician. In its vicinity, the Spaniards, under count de Montemar, gained a splendid victory over the Austrians on the 25th of May, 1734, the result of which was that Spain re-obtained possession of the kingdom of Naples.

BITTERFELD, a t. in Saxony, 17 m. n. of Leipsic, at the junction of the Lober and the Mulde; pop. '71, 5043. It has foundries, breweries, and various other manufactories. B. was founded in the 12th c. by the Flemings.

BITTENFELD, HERWARTH VON, a Prussian gen., one of the three leaders that commanded the invasion into Bohemia in 1866. B. was b. in 1796, and gained his first martial laurels in the war of liberation, especially in the battle of Leipsic. In the year 1848, he commanded the first regiment of the guards. In 1863, raised to the rank of gen., he acquired great fame through his daring crossing of the Sund, and capture of the isle of Alsen. In the campaign of 1866, he was intrusted with the occupation of Saxony, and then with the command of the army which advanced from Saxony into

Bohemia. He contributed largely to the brilliant victories of Hünerwasser, Gitschin, Münchengrätz, and Königgratz. On the outbreak of the war in 1870, B. was made governor of the Rhine provinces; and in the next year he was raised to the rank of general field-marshal. In the war of 1866, one of his sons fell; in that of 1870, two were killed.

BITTER CRESS. See CRESS.

BITTER KING, *Soulamrea amara*, a shrub or small tree of the natural order *polygalaceæ* (q.v.), a native of the Indian archipelago, which has received its name from its intense bitterness. The genus differs from the usual structure of the order in its regular flowers. The B. K. has large oval leaves and axillary racemes of flowers. It is used medicinally in fevers and other diseases.

BITTERN, *Botaurus*, according to some modern ornithologists, a genus of the heron (q.v.) family (*ardeinæ*); but regarded by others as a mere sub-genus of heron (*ardea*), and not a very well defined one. Bitterns are indeed chiefly distinguished from herons by the long, loose plumage of the neck, which they have the power of erecting at pleasure, along with the rest of their clothing feathers, so as greatly to increase their apparent size. The back of the neck, however, is merely downy, or almost bare, the long feathers being on the front and sides. Bitterns also differ from herons in the greater length of their toes, the middle toe being as long as the shank. They are almost all solitary birds, inhabiting reedy and marshy places, where they lie hid during the day, and will almost allow themselves to be trodden upon ere they take wing; they feed during the night, and then, also, often rise spirally to a great height into the air, and emit loud resounding cries. Their food consists chiefly of frogs, and partly, also, of fish, lizards, water-insects, etc., and even of small birds and quadrupeds. The claw of the middle toe is serrated on the inner edge, probably to aid in securing slippery prey. —The COMMON B. (*B. stellaris*, or *ardea stellaris*) is a bird very widely diffused over the old world, being found in almost all, at least of the temperate, parts of Europe, Asia, and Africa, which are sufficiently marshy for its manner of life. It is now rare in Britain, owing to drainage; but was formerly more common, and in the days of falconry, was carefully protected by law in England, on account of the sport which it afforded. Its flesh also was in high esteem, and is not rank and fishy, like that of the herons generally. In size, it is rather less than the common heron; the bill is about 4 in. long, the feathers on the crown of the head are greenish black, and the plumage in general of a dull yellow color, beautifully and irregularly marked and mottled with black. The B. makes a rude nest of sticks, reeds, etc., in its marshy haunts, and lays four or five greenish-brown eggs. It has a peculiar bellowing cry, which has obtained for it such English provincial names as mire-drum, bull of the bog, etc., and many of its appellations in other languages, perhaps even its name B. (*bitour, botur, botaurus*). Some naturalists used to assert that the booming cry of the B. was produced by the bird inserting its bill into a reed; that notion, however, has long since been exploded. When assailed, it fights desperately with bill and claws; and it is dangerous to approach it incautiously when wounded, as it strikes with its long sharp bill, if possible, at the eye. —The LITTLE B. (*B. minutus*, or *ardea minuta*) is common in some parts of Europe, but rare in Britain. Its whole length is only about 13 in.—The AMERICAN B. (*B. lentiginosus*, or *A. lentiginosa*), a species almost equal in size to the common B., and very similar to it in habits and voice, has occasionally been shot in Britain. It is common in many parts of North America, migrating northward and southward, according to the season. The crown of the head is reddish brown, and the colors and markings of the plumage differ considerably from those of the common B.—The LEAST B. (*B.* or *A. exilis*) is another North American species, of very small size, which is also migratory, and somewhat social in its habits. The AUSTRALIAN B. (*B.* or *A. australis*) is generally diffused throughout Australia, wherever marshes or sedgy rivers occur. In habits it closely resembles the B. of Europe. The head and upper parts generally are purplish brown, except the wings, which are buff, conspicuously freckled with brown; the throat, breast, and belly mottled brown and buff.

BITTERN, BITTER LIQUID, or SALT OIL, is an oily liquid obtained during the preparation of common salt (q.v.). When the mother-liquor of the evaporating pans ceases to deposit crystals of common salt, there is left behind in the boilers the material called bittern. It consists principally of a strong solution of common salt, along with Epsom salts, and other compounds of magnesia.

The B. at our salt-works is generally run into tanks, and during winter, it is employed as a source of Epsom salts. The B. is treated with a little sulphuric acid, which converts the chloride of magnesium ($MgCl$) into sulphate of magnesia ($MgOSO_3$), and on the liquid being allowed to cool, the crystals of Epsom salts (or sulphate of magnesia) separate.

BITTER PRINCIPLES are extracts from various plants by maceration in water or other liquid. Some bitter principles can be crystallized, while the bitter of hops and wild cherry cannot be so treated. Some of the vegetable bitters are soluble in water, and some in alcohol, and their properties are usually neuter, having neither bases nor acids. There is a wide use of bitters as a tonic, but the great portion of those sold are merely a disguise for strong drink, and of no other use to the drinker.

BITTERS are prepared from an infusion of herbs containing bitter principles. The plant generally used for the purpose is *archangelica officinalis*, or the *garden angelica*. See ANGELICA. The roots or seeds, or both, are placed in water, and the whole is left to simmer for several drys, when the infusion will be strong enough. The B. from angelica are not much used by physicians, having been superseded very much by infusions of gentian, etc.; but they are still used as a household medicine in town and country by elderly people. The chemical composition of the root is:

Bitter extractive	27.06
Volatile oil	0.70
Acrid soft resin	6.02
Gum and common salt	31.75
Starch	5.40
Woody fiber	8.60
Albumen	0.97
Water and loss	19.50
	100.00

The medicinal properties of B. are mainly those of a mild tonic and pungent aromatic stimulant, and hence they are serviceable as a stomachic in cases of weakness of the digestive organs. The taste is at first sweetish, rapidly becoming hot, aromatic, and bitter, and the odor is rather pleasant. The angelica root yields a larger amount of the bitter principle than angelica seeds. Camomile flowers, coriander-seeds, and other vegetable tonics and stimulants, are occasionally employed in the preparation of bitters.

BITTER SPAR, a name given to dolomite (q.v.), from the magnesia contained in it, which the Germans call *bitter salt*.

BITTERSWEET, or WOODY NIGHTSHADE (*solanum dulcamara*), a plant found in hedges and thickets in Britain, and in most parts of Europe, also in Asia and in North America. The root is perennial; the annual stems climbing and shrubby, many feet in length; the leaves ovate-heart-shaped, the upper ones spear-shaped; the flowers purple, in drooping corymbs, much resembling those of its congener, the potato, but much smaller, followed by ovate red berries of tempting appearance, which, being poisonous, are not unfrequently the cause of serious accidents, particularly to children. The twigs, collected in autumn after the leaves are fallen, are used in medicine as a diaphoretic and diuretic, and as a remedy for leprosy and other cutaneous disorders. See SOLANUM.

BITTER VETCH. See OROBUS.

BITTERWOOD, a name given to certain species of the genus *xylopia*, trees and shrubs remarkable for the bitterness of their wood, particularly the West Indian *X. glabra*. Furniture made of this wood is safe from the attacks of insects.—The genus *xylopia* belongs to the natural order *anonaceæ* (q.v.). The fruit of some of the species, particularly *X. sericea*, is highly aromatic and pungent like pepper. *X. sericea* is a large tree, a native of Brazil; its bark is used for making cordage, which is excellent.

B. is also the name of *pierœna excelsa* (formerly *quassia excelsa*), a tree of the natural order *simarubaceæ* (q.v.), a native of Jamaica, the wood of which is used in medicine for the same purposes as quassia (q.v.), and often under that name; indeed, it is probable that all the present quassia of the shops is really this wood. It is, botanically, very nearly allied to the true quassia, and possesses very similar properties, containing the crystallizable bitter principle called quassite or quassin. The wood, which is intensely bitter, is a very useful stomachic and tonic; an infusion of it is a well-known and useful fly-poison; and it appears to act as a powerful narcotic on many quadrupeds.

BITUMEN, a mineral substance, remarkable for its inflammability and its strong peculiar odor; generally, however, supposed to be of vegetable origin. The name, which was in use among the ancient Romans, is variously employed, sometimes to include a number of the substances called *mineral resins* (see RESINS), particularly the liquid mineral substances called *naphtha* (q.v.) and *petroleum* (q.v.) or mineral oil, and the solid ones called *mineral pitch*, *asphalt* (q.v.), *mineral caoutchouc*, etc.; sometimes in a more restricted sense it is applied by mineralogists only to some of these, and by some mineralogists to the solid, by others to the liquid ones. All these substances are, however, closely allied to each other. Naphtha and petroleum consist essentially of carbon and hydrogen alone, 84 to 88 per cent. being carbon; the others contain also a little oxygen, which is particularly the case in asphalt, the degree of their solidity appearing to depend upon the proportion of oxygen which they contain, which amounts in some specimens of asphalt to 10 per cent. Asphalt also contains a little nitrogen. Bituminous substances are generally found in connection with carboniferous rocks, in districts where there is, or evidently has been, volcanic agency. See the articles already referred to. Indeed, most kinds of coal contain B., and a substance essentially the same is produced from all kinds of coal by distillation; and whether before existing actually formed in the coal, or produced at the time by the action of heat, B. may often be seen bubbling from pieces of coal after they have begun to burn on an ordinary fire. Some of the shales of the coal-measures are very bituminous, as is also a kind of marl-slate abundant in some parts of the continent of Europe. See SHALE and MARL.—One of the most interesting

of the bituminous minerals is that called *mineral caoutchouc* or *elastic B.*, and for which the new name of *elaterite* has been devised, as if to support the dignity of its exaltation to the rank of a distinct mineral species. It is a very rare mineral, only three localities being known for it in the world—the Odin lead-mine in Derbyshire; a coal-mine at Montrelais, near Angers, in France; and a coal mine near South Bury, in Massachusetts. It is elastic and flexible like caoutchouc, and may be used, like it, for effacing pencil-marks. It is easily cut with a knife. Its color is blackish, reddish, or yellowish brown; and its specific gravity is sometimes a little less and sometimes a little more than that of water. It has a strong bituminous odor, and burns with a sooty flame.

BITU'MINOUS COAL is a term applied to the varieties of coal which contain a large percentage of volatile matter. They yield, on their destructive distillation, a considerable quantity of gas, remarkably pure, and with good illuminating qualities, and are consequently largely used for that purpose. See COAL.

BITU'MINOUS LIMESTONES are limestones impregnated and sometimes deeply colored with bituminous matter, obtained from decaying vegetables, or, more probably, from the decomposed remains of those animals the hard parts of which form so large an amount of the rock.

BITU'MINOUS SHALES are indurated beds of clay occurring in the coal-measures, and containing such an amount of carbon and volatile matter that they are able to keep up combustion when mixed with but a little coal. They are indeed impure coal, with a large percentage of ash or earthy matter, which after burning retains the original form. See COAL.

BITZIUS, ALBERT, better known under the *nom de plume* of Jeremias Gotthelf, a Swiss author, was b. at Morat, in the canton of Freiburg, 4th Oct., 1797. He was educated for the church; and after holding several cures, was appointed, in 1832, pastor of Lützelflüh, in Emmenthal, canton of Bern, which office he retained till his death. His first work was entitled *The Mirror of Peasants* (Burgsdorf, 1836). It is the touching history of a poor villager, Jeremias Gotthelf, which pseudonym B. ever after retained. In 1838 appeared his *Sorrows and Joys of a Schoolmaster;* in 1839, *Dursli, the Brandy Drinker*, and *How Five Maidens Miserably Perish in Brandy;* in 1842–46, *Scenes and Traditions of the Swiss*, in 6 vols., in which B. narrates, with great art, the old national legends, among which the most remarkable is the *Reconciliation*. The best and most popular of his stories, however, are *Grandmother Katy* (Berlin, 1848); *Uli, the Farm-servant* (Berlin, 2d edition, 1850); and *Stories and Pictures of Popular Life in Switzerland* (Berlin, 1851.) Subsequently, he wrote several pamplets against the German democrats, without, however, violating those popular sympathies and liberal convictions which pervade his writings, and which at an earlier period led him to vehemently oppose the family government of the Bernese aristocracy. His last work was *The Clergyman's Wife*, which appeared in 1854. Its author died on the 22d Oct. of the same year. B.'s writings are greatly relished in Switzerland. They are characterized by simplicity, inventiveness, a wonderful fidelity in the delineation of manners and habits, great vigor of description, and raciness of humor, while their tone is strictly moral and Christian.

BI'VALVE SHELLS or BIVALVES are those testaceous coverings of mollusks which consist of two concave plates or *valves*, united by a hinge. So long as molluscous animals provided with shells were considered by naturalists almost exclusively with respect to these, the order of B. S., originally established by Aristotle, retained its place (see CONCHOLOGY); and indeed the external character upon which it is founded is closely connected with some of the important structural characters according to which mollusks are now classified. See MOLLUSCA. A vast majority of recent B. S. belong to Cuvier's *testaceous* order of *acephalous mollusca*, the *lamellibranchiate* (q.v.) *mollusca* of Owen, although with them are classed some which were placed among *multivalves* (q.v.) by conchologists on account of accessory valves which they possess, and some which have a calcareous tube superadded to the true valves, or even taking their place as the chief covering of the animal. There are also mollusks of the class *brachiopoda* (q.v.), *palliobranchiata*, which possess B. S., as the *terebratulæ*, or lamp-shells (q.v.), etc. The structure of the shell, however, when closely examined, is found to be different in these two classes (see SHELL), although its general appearance is much the same. A very large proportion of the B. S. of the older fossiliferous rocks belong to the class brachiopoda.

In the brachiopoda, one valve is ventral, and the other dorsal; in the *lamellibranchiata*, the one is applied to the right side, and the other to the left side of the animal. The valves of ordinary B. S consist of layers, of which the outermost is always the smallest; and each inner one extends a little beyond it, so that the shell becomes thicker and stronger as it increases in length and breadth. The valves are connected at the hinge by an elastic ligament; and in general this consists of two parts, more or less distinct—one on the outside, to which the name *ligament* is sometimes restricted, and which is stretched by the closing of the valves; another, sometimes called the *spring*, more internal, which is compressed by the closing of the valves, and tends to open them when the compressing force of the *adductor* muscle or muscles is removed, the effect of which is to be seen in the gaping of the shell when the animal is dead. The hinge is often

furnished with teeth which lock into each other; sometimes it is quite destitute of them; sometimes the hinge-line is curved, sometimes straight. Conchological classification has been much founded upon characters taken from this part. The valves of some B. S. are equal and symmetrical, in others they are different from one another, particularly in those mollusks which, like the oyster, attach themselves permanently by one valve to some fixed substance, as a rock. Sometimes the valves of B. S. close completely at the pleasure of the animal; those of others always gape somewhere.

The point at the hinge, from which the formation of each valve has proceeded, is called the *umbo*. On the side of the umbo opposite to the ligament there is usually a small depression called the *lunule*. The marks, familiar to every one, upon the inside of a bivalve shell, are the impressions of the *mantle* of the (lamellibranchiate) mollusk, and of the adductor muscle or muscles.

BIV'OUAC (from the German *beiwacht*, or *bewachen*, to watch over) is the encampment of soldiers in the open air, without tents, where every one remains dressed, and with his weapons by him. Even during the seven years' war it was no uncommon thing for the whole army, when in the vicinity of the enemy, to pass the night in their ranks, each lying down in his place, in order to be ready to stand to their arms at a moment's notice. But the French revolutionary armies introduced the practice of dispensing with tents altogether, and regularly passing the night *en bivouac*. Hence in a great measure that rapidity in their motions which long made them uniformly successful; and the practice was afterwards imitated by the other armies of Europe, though less by the English. Soldiers in B. light fires, and improvise, where it is possible, huts of straw, branches, etc. But this mode of encampment, though favorable to celerity of movement, is purchased at the expense of the soldiers' health, besides being destructive of discipline, by leading to plundering and destroying of houses, fruit-trees, etc., in the vicinity. Accordingly, the tent is again coming into use, and for permanent encampments, regularly constructed wooden huts have been introduced. There are still, however, many cases where the B. is the only resource.

BIXA. See ARNOTTO.

BIZER'TA, or BENZER'TA (ancient *Hippo Diarrhytus*, or *Zaritus*), a seaport t. of Tunis, at the bottom of a deep gulf or bay of the Mediterranean, and at the mouth of a lagoon, united to the gulf by a narrow channel. It is the most northerly town in Africa, being about 38 m. n.w. of Tunis, in lat. 37° 17′ n., and long. 9° 51′ east. It is surrounded by walls, and defended by two castles; which, however, as they are commanded by the neighboring heights, are quite useless against a land attack. Its port, formerly one of the best in the Mediterranean, has been suffered to fill up, until now only small vessels can be admitted, though very little labor is required to give a uniform depth of 5 or 6 fathoms to the channel leading to the inner harbor or lagoon, which has a depth varying from 10 to 50 fathoms, and is extensive enough to afford accommodation to the largest navies. The adjacent country is remarkably fertile, but its cultivation is neglected. Pop. variously estimated at from 8000 to 14,000. Agathocles, between the years 310 and 307 B.C., fortified and provided B. with a new harbor; and under the Romans, it was a free city.

BIZIU'RA. See MUSK DUCK.

BJÖRNEBORG, or BIORNBORG, a t. or city in Finland, on the gulf of Bothnia, 72 m. n. of Abo; pop. 7270; has export trade in tar, pitch, lumber, etc. It was wholly burned in 1801.

BJÖRNSON, BJÖRNSTJERNE, b. 1832 in Norway; poet and novelist, first known by articles in a newspaper, *Folkblad*, in which he published sketches and stories. Later he issued *Fædrelandet*, *Thrond*, *Arne*, and *Synnøve Solbakken*. His stories in English are *Arne*, *Ovind*, *The Fisher Maiden*, *The Fishing Girl*, *The Happy Boy*, *The Newly Married Couple*, *Love and Life in Norway*, and others of later date.

BJÖRNSTJERNA, MAGNUS FRIEDRICH FERDINAND, Count, a Swedish statesman and author, was born 10th Oct., 1779, at Dresden, where his father then resided as secretary to the Swedish legation. He received his education in Germany, and entered Sweden for the first time in 1793 to join the army. In 1813 he was appointed lieut. in the Swedish army that went to aid the allies in Germany; took part in the conflicts at Grossbeeren and Dennewitz; was present at Leipsic, and concluded the formularies of capitulation with the French at Lübeck and Maestricht. Subsequently, he fought in Holstein, and in Norway, where he concluded the treaty that united that country with Sweden. In 1826 he received the title of count; and in 1828 was appointed ambassador to the court of Great Britian, which office he held till 1846, when he returned to Stockholm, where he died 6th Oct., 1847. As a politician B.'s opinions were liberal. In addition to some political writings, he published a work on the theogony, philosophy, and cosmogony of the Hindus in 1843.

BLACAS, PIERRE LOUIS JEAN CASIMIR, Duc de, 1771–1839; a member of the cabinet of Louis XVIII., and one of the confidential advisers of the bourbons. As ambassador in Rome he negotiated the concordat of 1817, and was afterwards minister at Naples. At the overthrow of Charles X. he went into exile, offering to the unfortunate king his fortune, which, however, was not accepted.

BLACK may be considered as the negation of color, resulting from the absorption of the rays of light by certain substances. Painters produce it by an unequal combination of the three primary colors. In mediæval art, B. was symbolical of evil, error, and woe; thus we find Christ, when the old illuminators wished to represent him as wrestling against the spirit of evil, arrayed in black drapery; and Byzantine painters, to express the sorrow of the Virgin Mary, gave her a black complexion. "All faces shall gather blackness," is the expression of Joel, when he wishes to convey the idea of the trouble of the people when the calamities which, with prophetic eye, he sees brooding over Jerusalem, should come to pass. B. clothing among some oriental nations was regarded as a badge of servitude, slavery, or low birth; among the Moors, it has several significations —obscurity, grief, despair, constancy. B. in blazonry, under the name of sable, denotes constancy, wisdom, and prudence. For B. as a funereal color, see FUNERALS and MOURNING.

BLACK PIGMENTS, used in painting, are derived principally from animal and vegetable substances. They are very numerous, and of different hues and degrees of transparency; but the most important are vegetable blue-black—obtained from beech-wood burned in close vessels—ivory-black, cork-black, and lamp-black, the principal constituent of all being charcoal or carbon. A fine-toned B. pigment is obtained by burning German or French Prussian blue. Combined with white, B. P., which are slow driers, yield grays of several tints.

BLACK, JEREMIAH S., b. Penn., 1810; admitted to the bar in 1830; president of his judicial district in 1842; elected judge of the supreme court of the state in 1851; and was chosen chief-justice. In 1857, president Buchanan made him attorney-general of the United States, and in 1860 secretary of state. He retired from the office when Lincoln's cabinet was appointed, and has since been engaged in his profession and in politics

BLACK, JOHN, an eminent newspaper editor, and classical scholar of some reputation, was a native of Berwickshire, his father being a shepherd, or farm-laborer, in the Lammermoors, near Dunse. Born in 1783, and left an orphan at twelve years of age, B. commenced life in the office of a Dunse writer, but he soon left that place for Edinburgh, where he was engaged for several years as a writer's clerk. While in this capacity, B. was assiduous in the work of self-education; and besides considerable progress made in classical studies at this time, he acquired German from a German musician in an Edinburgh band, and Italian from a refugee. Finding Edinburgh too limited a sphere for his energies, he went to London about the year 1810, and was immediately engaged as a parliamentary reporter for the *Morning Chronicle*, of which paper he afterwards became editor. Under his management the *Morning Chronicle* was celebrated for its independence and fearless advocacy of progress, and that at a time when subserviency was so common that it was regarded as little or no disgrace. He retired from the editorship in 1843, and continued to reside, until his death, which took place June 25, 1855, in a pleasant cottage on the Kentish estate of one of his friends. Among those who acted on the *Morning Chronicle* under Mr. Black was Mr. Charles Dickens, the eminent novelist. B. was author of a *Life of Tasso, with a Historical and Critical Account of his Writings*, 2 vols. (Edin. 1810), and the translator of the lectures of the brothers Schlegel on *Dramatic Art and Literature* (since republished by Bohn), and on the *History of Literature Ancient and Modern*, as well as of one or two works from the French and Italian.

BLACK, JOSEPH, an eminent chemist, was b. in 1728, at Bordeaux, where his father was engaged in the wine-trade. Both his parents were of Scotch descent, but natives of Belfast, to which their son was sent for his education in 1740. In 1746, he entered the university of Glasgow, and studied chemistry under Dr. Cullen. In 1751, he went to Edinburgh to complete his medical course, and in 1754 took his degree. His thesis on the nature of the causticity of lime and the alkalies, which he showed to be owing to the absence of the carbonic acid (called by him fixed air) present in limestone and in what are now called the carbonates of the alkalies, contained his first contribution to chemical science, and excited considerable attention. In 1756, on the removal of Cullen to Edinburgh, B. succeeded him as professor of anatomy (which branch he afterwards exchanged for medicine) and lecturer on chemistry in Glasgow. Between 1759 and 1763, he evolved that theory of "latent heat" on which his scientific fame chiefly rests, and which formed the immediate preliminary to the next great stride in discovery by his pupil and assistant James Watt. In 1766, Cullen was appointed to the chair of theoretical medicine in Edinburgh, and B. succeeded him in the chair of chemistry. Thenceforth he devoted himself chiefly to the elaboration of his lectures, in which he aimed at the utmost degree of perspicuity, and with perfect success. His class became one of the most popular in the university; it occasioned, however, some disappointment that one so capable of enlarging its territory made no further contributions to chemistry. Though of an extremely delicate constitution, he prolonged his life, by care and temperance, to the age of 71. He died on the 26th Nov., 1799. His lectures were published in 1803 (Edin., 2 vols., 4to), edited, with a biographical and critical preface, by prof. Robison.

BLACK ACTS are the acts of the Scottish parliament of the first five Jameses, those of queen Mary's reign, and of James VI., down to 1586 or 1587. They were called the B. A. because they were all printed in the black or Saxon characters. Several of these acts

were afterwards left out in the latter additions, most of them because they were private acts, and a few from reasons of state.

In English law-books, the expression "black act" is applied to the 9 Geo. I. c. 22, because it was occasioned by the outrages committed by persons with their faces blackened or otherwise disguised, and associated, as we are told in the preamble of the act, under the name of Blacks, who appeared in Epping forest, near Waltham in Essex, and destroyed the deer there, and committed other enormities. This act was, however, along with numerous other statutes, repealed in 1827, by the 7 and 8 Geo. IV. c. 27.

BLACK ART. See MAGIC.

BLACK ASSIZE, the popular name commemorative of an extraordinary and fatal pestilence which broke out at Oxford at the close of the assizes, July 6, 1577. The contemporary accounts describe it as having broken out in the court-house, immediately after the passing of sentence on Richard Jencks, a book-binder, condemned for alleged sedition to lose his ears. It was popularly interpreted as a divine judgment on the cruelty of the sentence, but the phenomenon is satisfactorily explained by the pestilential atmosphere of the adjoining jail, then, as it was until long after, a seat of misery, filth, and disease. From the 6th of July to the 12th of Aug., 510 persons are said to have died in Oxford and the neighborhood of this terrible malady, among whom were the chief officials who sat on the assize, most of the jury, and many members of the university. Women, poor people, physicians, visitors, and children are said to have escaped the infection. A similar event is recorded as having taken place at Cambridge at the Lent assizes in 1521 (Holinshed's *Chron.*, Stow's *Annals*, Wood's *Athen. Oxon.*, etc.).

BLACK-BAND IRONSTONE is an ore of iron found very extensively in Scotland and elsewhere. It occurs in the carboniferous system of geologists, in regular bands, layers, or strata, and generally associated with coal and limestone. It is mainly a carbonate of iron accompanied by much coaly matter. The following is the composition of several samples:

	A.	B.	C.	D.	E.	F.
Carbonate of iron*	51.58	50.40	40.62	29.14	53.38	63.80
Carbonate of lime.....	3.76	3.12	1.68	1.52	1.44	1.64
Carbonate of magnesia..	0.11	0.09	0.56	0.04	0.03	0.05
Alumina.....	0.74	0.82	trace	trace	trace	trace
Silica.....	20.96	26.56	8.48	19.84	2.76	4.48
Coaly matter.....	22.64	18.64	49.16	49.46	42.39	30.03
Water and loss.....	0.21	0.37				
	100.00	100.00	100.00	100.00	100.00	100.00
*Metallic iron, per cent..	25.20	25.79	19.61	14.06	25.77	30.80

The B. I. is easily reduced. It does not, however, yield a first-class iron when smelted by itself, and is therefore generally mixed with a small quantity of hematite (red iron ore), which communicates strength and hardness to the iron obtained.

BLACK BEETLE. See BLAPS and COCKROACH.

BLACKBERRY. See BRAMBLE.

BLACKBIRD, or MERLE, *Turdus merula* of some naturalists, *Merula vulgaris* of others, a well-known species of thrush (q.v.), common in all parts of Britain, and throughout Europe generally; found also in the n. of Africa and in the Azores. In Asia, it gives place to a closely allied species, *turdus pœcilopterus*. In size, the B. is intermediate between the missel-thrush and the song-thrush or mavis. The plumage of the adult male is wholly of a deep black color, the bill and orbits of the eyes yellow; the female and the young are of a dark rusty brown, with dusky bill and eyelids. The B. frequents hedges, thickets, and woods; is shy, restless, and vigilant, keeping much under cover of evergreens or shrubs; and when disturbed, takes wing with a vociferous chattering of alarm, seeking refuge in some neighboring thicket. Its food consists of worms, snails, insects, berries, etc. Its fondness for fruit makes it often annoying to the gardener; but probably it would in general be better to protect cherries and pears by nets than to shoot the B., which is of great use as a destroyer of insect larvæ. Like some of the other thrushes, it also devours great numbers of small snails, dexterously breaking the shell against a stone. It is not usually a gregarious bird, although great flocks sometimes appear upon the British coasts in winter, on their passage from more northerly to more southerly countries (*Selby*, quoted by *Yarrell*). Otherwise, the B. is not in Britain a bird of passage. It pairs very early in spring; the male and female are indeed very often seen together during winter; it builds its nest early, and generally has two broods in the year. The nest is generally placed in some thick bush; it is of ruder workmanship than that of the song-thrush, which, however, it resembles, and is usually formed of strong stems of grass, with a finer lining of dry grass inside, and a massive plastering of clay outside. The eggs are four or five in number, of a pale blue color, generally speckled with brown. The voice of the B. is very powerful, and its song more mellow than that of the thrush, but with "much less variety, compass, or execution." The B. is often kept as a cage-bird, and would be much more frequently so, but for the too great loudness of its song: it is very susceptible of being trained,

exhibits considerable powers of imitation, and has even been taught to speak.—The ring ouzel (q.v.), a bird very nearly allied to the B., is sometimes called the ring B.—The crow blackbirds (q.v.) of America are entirely different.—The SAVANNA B. of the West Indies is also of a different family. See CROTOPHAGA.

BLACKBIRD (*ante*), *Agelaius phœniceus*, in New England called the "redwing;" of glossy black plumage, except the small wing-covers, in which the first row of feathers is cream-colored and the remainder deep scarlet; about 9 in. long with a spread of wing 14 inches. The female is smaller, with the red and black less distinct. The B. visits all parts of America, arriving in New England usually about the 1st of April. It prefers swamps and low meadows, living upon insects, worms, and young corn; resting in the grass or low bushes, and depositing from three to half a dozen eggs, white with a shade of blue and faint lines of purple. These birds do much damage to corn in the fall, for which reason they are remorsely hunted. In some of the United States and Canada the name B. is given to the rusty grakle, *scolecophagus ferrugineus*, and in other places to the purple grakle, *quiscalus versicolor;* but these belong to the starling family.

BLACKBIRD, a co. in n.e. Nebraska, on the Missouri river; pop. '70, only 31. The whole co. is occupied by the Omaha (Indian) reservation.

BLACKBURN, a manufacturing t. in the middle of Lancashire, on the Blackburn stream now called simply "the brook," 21 m. n.n.w. from Manchester. It is much improved of late years, and has a very beautiful Gothic parish church. Coal and lime abound in the vicinity. The great business of the town is the manufacture of cotton stuffs. There are also woolen factories, and large establishments for the manufacture of weaving machinery. Above 200 years ago a kind of linsey-woolsey was well known as the "Blackburn checks," afterwards superseded by the "Blackburn grays," so called from their being printed unbleached. Here James Hargreaves (q.v.), a native of the town, invented the spinning-jenny in 1767. He was driven out of the country, and it was more than 40 years before B. followed in the general track of improvement introduced by his invention. Pop. in '71, 82,926. B. returns two members to parliament. B. has a grammar-school founded by queen Elizabeth in 1567, as well as a number of other educational establishments and religious and benevolent institutions. There is a public park of 50 acres open to the public. The finest building in the town is the exchange.

[The following is from *Chambers's Supplement.*]

BLACKBURN, an inland t. of Lancashire, England, 21 m. n.n.w. from Manchester, and 12¼ m. by railway e. by s. from Preston. It stands on a stream from which it appears to derive its name, a branch of the Ribble. The surrounding district, formerly known as *Blackburnshire*, or *Blaqbornshire*, was long very wild and dreary, but is now very populous. Coal and lime abound in it. B. had acquired some importance as a market-town in the 16th century. Its manufacturing prosperity can be traced back at least to the middle of the 17th c., when it was noted for the production of a kind of linsey-woolsey known by the name of *Blackburn checks*, afterwards superseded by the *Blackburn grays*, so-called from their being printed unbleached. In the course of the 18th c., the cotton manufacture became the chief industry of the town, which is now one of the chief seats of it, the number of cotton factories being very large, and many of them employing from 1000 to 2000 operatives. The value of the calicos and other cotton goods annually produced was estimated some years ago at nearly £2,000,000 sterling, and is now certainly much more. The steam-power employed in the works for spinning and weaving cotton has been more than doubled within the last 20 years. Many improvements in machinery for the cotton manufacture have been made in B., among which the first place in importance as well as in date must be assigned to the invention of the spinning-jenny, by James Hargreaves (q.v.), a native of the town, in 1767. His invention, however, was regarded with so much popular dislike that he was compelled to remove from the town, and it was not till the beginning of the present c. that it came into general use in the cotton-works of Blackburn. The pop of B. in '51 was 46,536; in '61, 63,126. In '71, pop. of municipal borough was 76,339; of parl. b., 82,928. A range of hills on the n. of the town shelters it from the coldest winds. Many of the streets are spacious, and the town is generally well built. A park of 50 acres, known as the *corporation park*, has recently been laid out for public recreation. The most elevated part of this park is about 700 ft. above the level of the sea, and commands a very extensive view. The parish church, St. Mary's, is a very beautiful Gothic building, erected between 30 and 40 years ago. There are numerous other places of worship, both of the established church and of various denominations of dissenters. The grammar-school was founded by queen Elizabeth in 1567; and there are many other educational establishments, and many benevolent and religious institutions. The finest building in the town is the exchange, built in 1865, in the Gothic style, and containing a magnificent room, 40 yards by 20. The town-hall is also worthy of being mentioned. B. is supplied with water from capacious reservoirs, which have been constructed in the neighborhood. The Leeds and Liverpool canal, passing on the s. side of the town, affords important facilities for the conveyance of goods; and B. is connected by several railways with all the neighboring towns, and so with all parts of the kingdom. B. is governed by a mayor, 12 aldermen, and 36 common

councilmen. It sends two members to parliament, a privilege which it obtained under the reform bill of 1832.

BLACKCAP, Blackcap Warbler, or Blackcap Fauvette (*curruca atricapilla*), a bird of the great family of the *sylviadæ*, or warblers, and of the same genus to which the nightingale is commonly referred. See Fauvette, Warbler, and Sylviadæ. It is regarded as the sweetest song-bird in Britain, or indeed in Europe, except the nightingale, to which it is said to be even superior in "its shake or trilling note." Very often, however, the strain is desultory, and of short continuance; but it is loud, rich in tone, and has a "great variety of sweet and gentle modulations." White says, in his *Natural History of Selborne*, that while the B. warbles, its throat is wonderfully distended. It is a rather smaller bird than the nightingale; the female is larger than the male. The back, wings, and tail are of an ash-brown color; the chin, throat, and breast are gray; the belly, white. The upper part of the head in the male is jet-black; in the female of a dull rust color. The feathers of the head, both in the male and female, are somewhat erected, giving the bird a hooded appearance, on account of which it is called in Germany *the monk*. In Britain, the B. is a bird of passage, arriving early in spring, and retiring in Sept. The males, as in the case of the nightingale, arrive a few days before the females. The B. is not a common bird in Britain: it is most frequent in the southern counties of England, but is found even in Scotland; on the continent, it extends its migrations as far n. as Lapland. In the s. of Europe, it is found both in summer and winter. As a cage-bird, it is pleasing not only on account of its song—which, however, is sometimes partly spoiled by its too successful imitation of other birds—but also on account of its manners, the intelligence which it displays, and its strong attachment to those who are accustomed to feed and caress it.

BLACKCAP TITMOUSE, or Chickadee', a North American bird. See Titmouse. The marsh titmouse, a British bird, is sometimes called blackcap, or blackcap Titmouse.

BLACK CHALK is a variety of clay-slate (q.v.), containing a considerable proportion of carbon. It is used for drawing, and is also ground down to form a black paint. It is found as a rock of a slaty texture and bluish-black color in the island of Islay and in Caernarvonshire, also in Spain, and other parts of the world.

BLACKCOCK, Heath-Fowl, or Black Grouse, *Tetrao tetrix*, a species of grouse (q.v.), abundant in Britain wherever there are moors of considerable extent, and more particularly where there are bogs and morasses with rank herbage, or, adjacent to the moors, natural woods or young plantations of pine and fir. Comparatively rare in the s. of England, the B. becomes more common towards the n., and is very plentiful in the mountainous parts of Scotland. It is found in some of the Hebrides, but not in the Orkney or Shetland isles. On the continent of Europe, it occurs both in mountainous and marshy countries, as on the Alps and in Holland; it is found as far s. as the Apennines, and as far n. as the forests of Lapland; it abounds in most parts of Scandinavia, where it is carefully protected, the males only being killed, great numbers of which are sent to the London market; it is diffused over almost all parts of Russia, and is found in Siberia. The male is much larger than the female, sometimes weighing as much as 4 lbs., whilst the female weighs only about 2 lbs.; they also differ very much in plumage. The male is of a shining bluish-black color, with a conspicuous white bar on the wings below the ends of the great wing-coverts, and a mixture of black and white on the legs; there is a piece of bare scarlet skin over the eye; the outer feathers on each side of the tail are elongated and curve outwards, giving it a very peculiar appearance. The female, called the *gray hen*, is of a rust color, darkest on the upper parts, everywhere barred and mottled with a darker color; the tail is straight and even at the end. The young males resemble the females in plumage. The shank in this species is feathered, but not the toes. It is a gregarious bird, the different sexes, however, in winter, generally keeping in flocks by themselves. In spring, the males resort to elevated and open spots, where they crow, and also make a sound which has been likened to the whetting of a scythe, thus inviting the females to repair to them; they strut and trail their wings like turkey-cocks, and fierce contests often take place among them. They are polygamous, and pay no attention to the female during incubation, nor do they take any part in rearing the young.—The nest is of the simplest construction, a few straws or the like, placed together among tall heath, or under the shelter of a low thick bush. The eggs, six to eight in number, are yellowish-white, speckled with orange-brown, and about 2 in. long. The food of the B. consists of the seeds of rushes and other plants, berries, insects, the tender shoots of heath, leaves, etc.; it sometimes visits cornfields and stubbles to feed on corn; is frequently to be found in turnip-fields in the neighborhood of plantations in hilly districts; and, at least in winter, eats the young shoots of pines, firs, birches, and alders. It is highly esteemed for the table.

It seems to be well established that hybrids are occasionally produced between the B. and other species of grouse; and also between the B. and the pheasant; but this subject, although regarded with much interest by some of the greatest naturalists, has not yet received the investigation which it deserves, and nothing appears to be known concerning any offspring of such hybrids. See Yarrell's *British Birds*, ii. 289–314. It can only be deemed probable, not certain, that the bird called *tetrao hybridus*, sometimes

found in the Scandinavian peninsula and other parts of Europe, is a hybrid between the B. and the capercailzie (q.v.).

BLACK DEATH was one of the names given to an oriental plague marked by inflammatory boils and tumors, which in the 14th c. desolated the world. It took this name from the black spots, symptomatic of a putrid decomposition, which, at one of its stages, appeared upon the skin.

Our information as to the symptoms and course of this terrible malady is far from perfect. So much is clear, that they varied somewhat from case to case, and in different countries, and greatly changed towards the close of the period of its ravages in Europe (1348–51). Among them may be noticed great imposthumes on the thighs and arms—what are called buboes—and smaller boils on the arms and face; in many cases, black spots all over the body; and in some, affection of the head, stupor, and palsy of the tongue, which became black as if suffused with blood; burning and unslakable thirst; putrid inflammation of the lungs, attended by acute pains in the chest, the expectoration of blood, and a fetid pestiferous breath. On the first appearance of the plague in Europe, fever, the evacuation of blood, and carbuncular affection of the lungs brought death before the other symptoms could be developed; afterwards, boils and buboes characterized its fatal course in Europe as in the east. In almost all cases its victims perished in two or three days after being attacked. Its spots and tumors were the seals of a doom which medicine had no power to avert, and which in despair many anticipated by self-slaughter.

If the symptoms of the B. D. have been only imperfectly handed down to us, the history of its rise and progress is still more obscure. But while fable enters largely into its history, it would seem to be safe to assign its birthplace to China; and there is a strong concurrence of testimony, that the causes which co-operate to produced it are to be sought for as far back as 1333—15 years before its outbreak in Europe—in a series of great convulsions of the earth's structure, which commenced in that year, and which, for 26 years thereafter, continued powerfully to affect the conditions of animal and vegetable life. The precise date of the appearance of the plague in China is unknown, but from 1333 till 1348, that great country suffered a terrible mortality from droughts, famines, floods, earthquakes which swallowed mountains, and swarms of innumerable locusts; and in the last few years of that period, from the plague. During the same time Europe manifested sympathy with the changes which affected the east. The order of the seasons seemed at various times to be inverted; storms of thunder and lightning were frequent in the dead of winter, and there occurred great earthquakes and eruptions of volcanoes conceived to have become extinct. The theory is, that this great tellurian activity, accompanied by the decomposition of vast organic masses, myriads of bodies of men, brutes, and locusts, produced some change in the atmosphere unfavorable to life; and some writers, speaking of the established progress of the plague from east to west, say that the impure air was actually visible, as it approached with its burden of death. "A dense and awful fog was seen in the heavens, rising in the east, and descending upon Italy" (*Mansfeld Chronicle in Cyriac Spangenberg*, chap. 287, fol. 336). With this view of the plague is to be conjoined another regarding the causes which produced a predisposition of the inhabitants of Europe to become its victims, and which are referred to the effects on the popular health partly of scarcity and partly of the prevalent bad habits of living. There is much probability in the theory, that the plague was owing to an atmospheric poison acting on the organs of respiration, which, it will be recollected, were always those first attacked. But while impurity of the air and the state of the public health may have largely contributed to the mortality, it may be doubted whether the disease did not owe its extension almost wholly to infection and contagion, whatever causes may have originally produced it. It appears that the pestilence had in a milder form appeared in Europe in 1342, but it had passed away, and there is little reason for holding that, in the interval, it remained merely latent. The invasion of 1548 may actually be tracked from China in its advance by the various caravan routes towards the west. The northern coast of the Black sea sent the plague by contagion to Constantinople. By contagion it reached the seaports of Italy, and thence, as from so many foci of contagion, it soon established itself over Europe. Its advance may be traced through Germany and France to England, from which it was transmitted to Sweden. It was three years from its appearance at Constantinople, before it crept, by a great circle, to the Russian territories. This fact of its spread by contagion has led to speculations as to whether, by rigid rules of quarantine, it might not have been excluded from Europe. Such rules are now at many points in force as securities against oriental plagues.

There are no proper materials for estimating the mortality which this plague produced, for it occurred before the value of statistics was appreciated. But in China, 13,000,000 are said to have died, and in the rest of the east nearly 24,000,000. These numbers appal the imagination. Coming to Europe, the horror is increased by the greater exactness of the details. London alone lost over 100,000 souls; 15 European cities lost among them about 300,000; Germany is calculated to have lost 1,244,434; Italy, one half of its population. On a moderate calculation, it may be assumed that there perished in Europe 25,000,000 human beings. Africa suffered with the rest of the known world. Everywhere was death. All animal life was threatened. Rivers were consecrated to

receive corpses, for which none dared perform the rites of burial, and which in other places were cast in thousands into huge pits made for their reception. Death was on the sea, too, as well as on the land, and the imagination is quickened to the realization of the terrible mortality by accounts of ships without crews—the crews dead and putrefying on the decks of the aimless hulls—drifting through the Mediterranean, the Black and the North seas, and cursing with the contagion the shores on which winds or the tide chanced to cast them.

The mortality caused by the plague was, however, only one of the evils to which it gave rise. Its moral effects on the survivors and the frame of society were no less momentous. Many died of fear, which among the living dissolved the ties of kindred; mothers forsook their plague-stricken children; the worldly became quickened to a maddening sense of sin; the religious fixed their eyes more steadily on futurity; all rushed to sacrifice their means to the church, while the ecclesiastics drew back from the gold showered over their walls, as being tainted with death. Superstition finally banded multitudes together by common means to work out the common safety. In Hungary, and afterwards in Germany, rose the brotherhood of the Flagellants, who undertook to expiate the sins of the people, and avert the pestilence by self-imposed sufferings. Originally of the lower classes, they gathered to their order, as it extended, crowds of the highest, both men and women, and marched from city to city, robed in somber garments, with red crosses on the breast, back, and cap, and with their heads covered as far as the eyes; they went chanting in solemn processions with banners, with down-turned faces, and bearing triple scourges with points of iron, with which, at stated times, they lacerated their bodies. They at last pervaded nearly all Europe; Germany, Hungary, Poland, Bohemia, Silesia, and Flanders did them homage. This, however, is not the place to give their history, for which the reader will refer to the article under the head FLAGELLANTS. Suffice it that the order was not suppressed till the pope, at the instigation of several crowned heads, prohibited throughout Christendom their pilgrimages, on pain of excommunication. While the wanderings of the Flagellants threw society into confusion, and helped to spread the plague, the horrors of the time were further heightened by the fearful persecutions to which the Jews were subjected, from a popular belief that the pestilence was owing to their poisoning the public wells. The people rose to exterminate the Hebrew race, of whom, in Mayence alone, 12,000 were cruelly murdered. They were killed by fire and by torture wherever they could be found, and for them, to the terrors of the plague were added those of a populace everywhere infuriated against them. In some places, the Jewish people immolated themselves in masses; in others, not a soul of them survived the assaults of their enemies. No adequate notion can be conveyed of these horrors. To aggravate the pestilence, the poison-panic made the people shut up their wells. With terror of poison and of plague in a state of society rude at the best, but now disorganized, what means were available to mitigate or prevent the sufferings of the people were rendered altogether nugatory.

It would be useless to attempt to give any notion of the effects on society of this plague; how during it some, like people in sieges, came to be callous, and some, like thieves under the gallows, to regard the desolation only as it afforded opportunities for plunder and indulgence. The whole phenomena would form a fine study for the social philosopher and psychologist. We must content ourselves here with referring the reader to the *Decameron* of Boccaccio for a description of the plague at Florence, which, for vividness and particularity of observation, almost equals Thucydides' account of the plague at Athens. In Bulwer's *Rienzi*, also, an account of the plague will be found. The reader should also consult Hecker's *Epidemics of the Middle Ages*, translated for the Sydenham society. Accounts of the plague have been left us by the physicians Guy de Chauliac and Chalin de Vinario. But perhaps Boccaccio's is the best of the whole. The B. D. afterwards more than once appeared in Europe, but never with the same virulence or duration.

BLACK DEATH, THE RECENT, is the title commonly given to a very fatal disease which occurred in Ireland, in an epidemic form, in the years 1866–67. It is described under the title of EPIDEMIC CEREBRAL MENINGITIS.

BLACK DUCK, *Anas obscura*, one of the most valuable of game birds, generally abundant over all the United States, and believed to be capable of domestication. Its color is brown-black, with bright tints about the neck and bill.

BLACKFEET, or SATSIKA, a tribe of Algonquin Indians originally residing on and near the Saskatchewan, but migrating to Missouri. There are at present three divisions of them scattered over the borders of British America and the United States from Hudson's bay to the Yellowstone region. The B. are warlike, and sun-worshipers; they do not bury their dead, but, in case of a warrior, leave him in his tent in full dress, and sacrifice horses at his door for his use in the happy hunting-grounds. It is supposed that there are about 7000 in the United States and 6000 in Canada.

BLACKFISH, *Centro'lophus moris*, a fish of the family of the *scombe'rida* (q.v.), very nearly allied to the beautiful coryphens (q.v.) so frequently called dolphins. It is found both in the Mediterranean sea and on the western coasts of Europe, occasionally on the southern coasts of Britain, but is everywhere rare, perhaps because it is an inhabitant chiefly of deep waters. It is known to attain a length of more than 30 in., and a weight

of 14 lbs. The general form is not unlike that of a perch; there is a single elongated dorsal fin with short rays, rising from a thin elevated ridge; the body is covered with minute scales, the skin is tough and can be stripped off like that of an eel; there is no air-bladder. The color is black; that of the fins intensely so. The B. is remarkable for great strength and velocity. As an article of food, it is described as delicious.

BLACK FLUX is prepared by heating in a covered crucible ordinary or crude cream of tartar, or the bitartrate of potash ($KO,HO,C_8H_4O_{10}$), when the tartaric acid ($C_8H_4O_{10}$) is decomposed and charred, forming carbonic acid (CO_2), which remains in combination with the potash (KO) as carbonate of potash (KO,CO_2), accompanied by much free carbon. This very intimate mixture of carbonate of potash and carbon, otherwise called B. F., is a fine black powder of great service in the fluxing of metallic ores, as of lead (q.v.), and the separation of the metal therefrom. The B. F. is likewise employed as the raw material from which, on the application of heat in iron vessels, the metal potassium can be obtained.

BLACK FLY, a dipterous insect, the especial torment of man and beast in the arctic and northern temperate latitudes. In the eastern British provinces and Labrador they are more abundant than mosquitoes in the tropics, crawling under the closest garments and into beds, and defying all means of protection. They are very small, mere midges, hardly visible, black, with one white band. In wet weather they are dormant, but in clear sunny days they almost cloud the sun, and can be only partially dispersed by the Indian remedy of a dense smoke. Tar ointment on the exposed skin is said to be the best defense. Their bite is like a sting, but seldom creates swelling, and is not dangerous. Seth Green says that the larva of this fly spins a web under water as perfect as that of a spider. The buffalo gnat of the west is a larger species of this fly, and is said to have destroyed even horses by its bite.

BLACKFORD, a co. in e. central Indiana, on the Salamonie river, traversed by the Fort Wayne, Muncie and Cincinnati railroad; 180 sq.m.; pop. '70, 6272; level and rolling surface and fertile soil; products agricultural. Co. seat, Hartford city.

BLACK FOREST (Ger. Schwarzwald), a wooded mountain-chain in Baden and Würtemberg, running from s. to n. along the western side of Swabia, parallel with the course of the Rhine after its great bend near Basel, and often only a few miles distant from it. The Rhine also bounds it on the s., and the level country between the Enz and the confluence of the Neckar with the Rhine borders it on the n.; lat. 47° 30′ to 49° 30′ n., long. 7° 40′ to 9° east. The chief rivers rising in the B. F. are the Danube, Neckar, Murg, Kinzig, Elz, Enz, and Wiessen. The B. F. attains its greatest elevation in the bare and round-topped Feldberg (about 4850 ft. high), which rises near the source of the Wiessen and the celebrated Hölle (Hell) pass, a narrow valley shut in by mountains in the vicinity of Neustadt. The great mass called the Kaiserstuhl (emperor's chair), situated near Breisach, is quite isolated. As to the geological character of the B. F., primitive granite and gneiss form its core, porphyry is found on its sides, and sandstone along its highest ridges, as well as at its base. Silver, copper, cobalt, lead, and iron are found in greater or less quantity in its principal chain, which is luxuriantly wooded, its name Schwarzwald being derived from the dark-tinted foliage and immense number of its fir-trees. The B. F. is also rich in mineral waters, as, e.g., the baths of Baden-Baden and Wildbad (q.v.). On the Rhine side, the descent is precipitous, but towards the Danube and the Neckar it is gradual. Among its numerous valleys, the Murgthal is the most famous for its natural beauties. The western slopes are studded with vineyards. Summer rye, oats, and potatoes are cultivated in some parts of the B. F.; but it is with difficulty, and the rearing of cattle is prosecuted with much greater success. This, and the manufacture of articles of wood, forms the chief industry of the inhabitants. The making of wooden clocks and other kinds of timepieces employs about 40,000 persons; and not less than 600,000 articles of this kind, including music boxes, are exported annually to all parts of the world, 1000 dealers being engaged in the traffic.

Two of the passes of the B. F., the Kniebis and the Hölle, acquired considerable celebrity during the wars of the French revolution. The first, situated on the borders between Baden and Würtemberg, at the source of the Murg, was taken by the French in 1796 and in 1797; the Hölle is known in connection with Moreau's retreat in 1796.

BLACKFRIARS. See DOMINICANS, *ante*.

BLACK FRIDAY, in England, 6th Dec., 1745, the day on which news reached London that the Pretender had arrived at Derby. Again, May 11, 1866, when the failure of Overend, Gurney, etc. (on the previous day) brought on a most disastrous financial panic. In America, Sept 25, 1869, when the wild speculation in gold, in New York and other cities, culminated in a crash that swept thousands of firms and individuals into financial ruin.

BLACK GUARDS, originally applied to the scullions and lower servants of the English court who were clothed in black garments. Gibbon says, "those who carried coals to the kitchen, rode with the pots and pans, and were in derision called the black guards." The title is recognized in an official proclamation of 1683, which says:

"whereas, a sort of vicious, idle, and masterless boyes and rogues, commonly called the black guard, with divers other lewd and loose fellows," etc.

BLACK GUM, the popular name of the *Nyssa multiflora*, the "hornpipe" of New England, and "pepperidge" of the middle states. It grows in thick forests, has crooked branches, and is densely covered with bright green leaves in turfs of four or more at the ends of the branches; bears flowers of greenish hue, becoming blue-black as they ripen; wood close-grained and very tough, but not durable. The timber is used for hubs of wheels and in other places where splitting is to be avoided. It is an ornamental tree in England.

BLACK HAWK, a co. in n.e. Iowa, on Cedar river; reached by the Iowa division of the Illinois Central, and the Burlington, Cedar Rapids, and Northern railroads; 576 sq.m.; pop. '75, 22,913; in '80, 23,913; prairie surface with some forests, producing wheat, corn, oats, butter, etc. Co. seat, Waterloo.

BLACK HAWK, b. about 1768, in a village of Sac Indians on the Mississippi, near Rock river; d. Oct. 3, 1838. In the war of 1812, Black Hawk, then a leading Sac and Fox chief, took the English side. After the war he resisted the encroachments of white settlers, and provoked several petty conflicts, but was subdued and captured in 1832. The tribe was removed, but Black Hawk and his sons and a few warriors were kept a while as hostages, and brought as a show to the eastern cities.

BLACKHEATH, a high-lying open common, in the county of Kent, 5 m. s.e. of London, near Greenwich Park. It commands a fine view of great extent, and being a healthy tract, many villas have been built on its margin. It is a favorite holiday resort for Londoners. The Roman road to Dover crossed it. B. is one of the few places in England where the ancient Scottish game of golf is practiced. On it stands Morden college, founded in 1695 by sir J. Morden for decayed merchants, and with a revenue of £5000. B. was formerly the scene of several insurrections, including those of Wat Tyler, 1381, and Jack Cade, 1450. Here the Danes encamped in 1011; the Londoners welcomed Henry V. from Agincourt; and Charles II., on his way from Dover, met the army of the restoration. B. was also a noted place for highwaymen.

BLACK HILLS, a mountain region in s.w. Dakota and n.e. Wyoming, about 100 by 60 m., rich in mines. In 1876–77 there was trouble with the Indians, whose reservations covering much of the country were invaded by whites in search of gold and silver. Within a few months a number of settlements grew up like Jonah's gourd, and the names of the new towns, Deadwood, Gayville, Central city, Lead city, and others appeared in the newspapers. The mining business continued prosperous, and the product of gold up to the close of 1878 was nearly $2,300,000. The hills are from 2500 to 3000 ft. above sea-level at their base, and the highest peak is 6700 feet. They are a continuation of the Big Horn spur of the Rocky mountains. (See DAKOTA.)

BLACK HOLE, an appellation familiarly given to a dungeon or dark cell in a prison, and which is associated in the public mind with a horrible catastrophe in the history of British India—namely, the cruel confinement of a party of English in an apartment called the "Black Hole of Calcutta," on the night of the 18th of June, 1756. The garrison of the fort connected with the English factory at Calcutta having been captured by the nabob Suraja Dowlah, this barbarian caused the whole of the prisoners taken, 146 in number, to be confined in an apartment 20 ft. square. This cell had only two small windows, and these were obstructed by a veranda. The crush of the unhappy sufferers was dreadful; and after a night of excruciating agony from pressure, heat, thirst, and want of air, there were in the morning only 23 survivors, the ghastliest forms ever seen on earth. See HINDUSTAN.

BLACKIE, JOHN STUART, professor of Greek in the university of Edinburgh, was b. in Glasgow in 1809, but received his early education in Aberdeen, where his father was agent for a bank. After going through the usual course of a Scotch university education —partly at Marischal college, Aberdeen, partly at Edinburgh—with a view to the church, he went in 1829 to Germany, and studied for some time both at Göttingen and Berlin. He thus acquired a mastery of German, and an acquaintance more extensive than ordinary with the literature of that language. On his return, having abandoned the thought of entering the church, he began the study of law, and passed as advocate at the Edinburgh bar in 1834. But he soon found the practice of the profession uncongenial, and devoted himself henceforth to literary pursuits. Among his earliest productions was his translation, in English verse, of Goethe's *Faust*, which was preferred by G. H. Lewes to any other of the metrical translations. He wrote also about this period numerous articles in the *Foreign Quarterly Review*, the *Westminster*, *Blackwood*, and *Tait*, chiefly on German subjects. In 1841, he was appointed by the crown to the chair of humanity in Marischal college, which he held until, in 1852, he was elected to the Greek chair in the university of Edinburgh. Ever since he became professor, he has been incessant in advocating educational reform in Scotland. He took an active part in the movement that led in 1859 to the remodeling of the Scottish universities. During 1874–76, B. advocated throughout the country, with great enthusiasm, the foundation of a Celtic chair in Edinburgh university, and was successful in raising upwards of £10,000 of endowment. Of works of a professional and philological kind may be men-

tioned two lectures *On the Studying and Teaching of Languages; On the Rhythmical Declamation of the Ancients; The Pronunciation of Greek; Accent and Quantity*, 1852. Among the most matured and scholarly of B.'s productions is his metrical translation, with notes, of the dramas of Æschylus, published in 1850. In 1853, he spent above three months in Athens, acquiring a complete mastery of the language as now spoken; and as fruits of the visit, there appeared articles on the subject in the *North British* and *Westminster Reviews*. In 1866, prof. B. gave to the world *The Iliad of Homer, translated into English Verse, with Commentary and Introductory Dissertations* (Edin.), in which he endeavors to present Homer to the English reader in his distinctive character as a popular singer. Of late years B. devoted himself with enthusiasm and success to raising funds for the endowment of a Celtic chair in the university of Edinburgh. In 1878 he spent some months in Egypt.

Not content with educational and philological subjects, the versatile activity of prof. B. has led him to make incursions into the fields both of abstract speculation and of poetry. He published in 1858 a treatise on *beauty*, in refutation of lord Jeffrey's association theory. Others of his works are *Lays and Legends of Ancient Greece, with other Poems* (1857); *Lyrical Poems* (1860); *Musa Burschicosa* (1869); *War Songs of the Germans* a translation, 1870; *Four Phases of Morals* (1871); *Songs of the Highlands and Islands* 1872); *Self Culture* (1873); *Horæ Hellenicæ* (1874); *Songs of Religion and Life* (1876).

BLACKING is the material employed for producing a black glazed shining surface on leather. The main ingredient in the various kind of B. is bone-black (q.v.), which is mixed with an oil, some sugar, and a little sulphuric acid. The materials in Day and Martin's B. are finely powdered bone-black ground with sperm-oil, raw sugar or molasses, a little vinegar, and some concentrated sulphuric acid (specific gravity 1850). The substances are incorporated together one by one in the order in which they are stated, and the action of the sulphuric acid is to convert much of the lime in the bone-black into sulphate of lime, which causes a thickening of the mixture, and a tenacious paste results. This paste, diluted with weak vinegar, is put, while warm, in stone-ware bottles, and is then ready for the market.

BLACK JACK, the name given by miners to blende (q.v.). It was also the name applied in former times to a kind of drinking flagon.—B. J. (tree), see OAK.—B. J. or NIGGER CATERPILLAR, see TURNIP SAWFLY.

BLACK LEAD, GRAPHITE, or PLUMBAGO, a mineral consisting chiefly of carbon, but containing also more or less of alumina, silica, lime, iron, etc., to the extent of 1 to 47 per cent, apparently mixed rather than chemically combined. B. L. is the popular name, and that by which it is generally known in the arts; graphite is that generally preferred by mineralogists.—The name B. L., however, ought, perhaps, to be regarded as an unfortunate one, as no lead enters into the composition of the mineral. It sometimes occurs crystallized in short imbedded hexagonal prisms; but generally massive, and more or less radiated, foliated, scaly, or compact. It is of a grayish-black color, with a somewhat metallic luster, and is perfectly opaque. It is greasy to the touch, and is a perfect conductor of electricity. It is found in primary and transition rocks, as in gneiss, mica-slate, quartz-rock, greenstone, and clay-slate, and pretty abundantly in various parts of the world. It is much more combustible than even anthracite (or *blind-coal*), burning with much difficulty even before the blow-pipe, on which account it is much used for the manufacture of crucibles or "melting-pots," which withstand a great heat. These are not, however, made of mere B. L., but of B. L. in powder, mixed with half its weight of clay. B. L. is employed for making pencils (q.v.). It is also extensively employed to give a black gloss to iron grates, stoves, railings, etc., and to diminish the friction of the belts and other parts of machinery. Lately it has been suggested as a lubricating agent in the cartridges of rifles, instead of lard or tallow.—Much B. L. is obtained at Borrowdale, in Cumberland; there are also great deposits in Siberia, and in Missouri, U. S.

BLACK LETTER (**Black Letter**), the name commonly given in this country to the types which on the continent are most generally known as Gothic. The first printed books imitated every peculiarity of the contemporary manuscripts; and as printing was first practiced in Germany and the Netherlands, the first types were copies of the letters in use in those countries in the middle of the 15th century. Two sorts of letters have been employed in the writings of western Christendom. What have been called Roman letters prevailed from the 5th to about the close of the 12th c., when they gradually began to pass into what have been called Gothic letters, which continued till the 16th c., when, in most European countries, they were superseded by Roman letters. The first types, as has been said, were Gothic, and they spread with the art of printing into various European states. In France and Italy, they were slightly modified by cutting off some of their rougher points; and when thus trimmed, they came to be known in the former country as *lettres de somme*, being so called, it is said, from their use in an edition of the *Summa* of St. Thomas Aquinas. The classic taste of Italy could not long tolerate the Gothic character even of the *lettres de somme;* and they were still further modified, until they assumed the shape to which the name of Roman letters has since been given. The first works printed with these new types were two beautiful editions of Pliny's *Natural History:* the one by John of Spira at Venice in 1469, and the other by his disciple,

Nicholas Jenson, also at Venice, in 1472. Another Venetian printer—the first Aldus Manutius—attempted in 1501 to supersede the Roman letters by what have been called Aldine (q.v.) or Venetian, but are best known as Italic characters. These can scarcely be said to have come into much more than temporary or exceptional use; but the Roman letters in no long time spread from Venice all over the west of Europe. Although thus supplanted in general use, the Gothic or B. L. was long retained for special purposes, such as, in this country, the printing of bibles, prayer-books, proclamations, and acts of parliament. Books in B. L. being the earliest, are highly prized by antiquaries and bibliomaniacs, who are hence sometimes spoken of as "black-letter" devotees. Thus, Matthias, in his *Pursuits of Literature* (published in 1796), alluding to the commentators on Shakespeare, writes:

> On Avon's banks I heard Actæon mourn,
> By fell *black-letter dogs* in pieces torn;
> Dogs that from Gothic kennels eager start, etc.

A form of the B. L. still continues in general use in Germany, but of late has begun to give way in some quarters to the Roman.

BLACK LIST. Such is the name familiarly applied to printed lists connected with insolvency, bankruptcy, and other matters affecting the credit of firms and individuals, and which are circulated for the private guidance of the mercantile community. These lists, which serve an important purpose, are well known by commercial men in the United Kingdom. For the most part they are published in London weekly; but some are biweekly. In their contents are embraced the English bankruptcies and liquidations by arrangement under the act of 1870; the bankruptcies of Scotland and Ireland; Scottish registers of protested bills; decrees in absence; judgments for debt in the Irish courts; offers of composition; dissolutions of partnership; warrants of attorney and cognovits; judges' orders; bills of sale, etc. The legality of issuing information of this kind has been challenged, but it has been determined that it is quite lawful. In point of fact, the lists are only extracts from public registers, as are the ordinary lists of bankruptcies in the newspapers. Private lists of a more searching kind are furnished to subscribers by Mr. Thomas Perry of Cornhill, the proprietor of the "original bankrupt and insolvent registry office, for protection against fraud, swindlers," etc.; and also by the Scottish trade protection society, Edinburgh. See TRADE PROTECTION SOCIETIES. In the United States, printed lists of forgeries of bank-notes are similarly issued. In one of these *counterfeit detectors*—which is certainly *black* enough—may be counted some thousands of varieties of forged bank-notes in circulation; the whole revealing a frightful state of commercial and moral depravity.

BLACKLOCK, THOMAS, D.D., a remarkable example of the power of the mind to overcome the most oppressive disadvantages, was b. at Annan in 1721, and d. at Edinburgh in 1791. The child of humble parents, and deprived before he was six months old of the power of sight, he won for himself before he reached middle age the designation of an accomplished scholar, a cultivated thinker, and, for those times, a respectable poet. After going through the necessary course of academic study in Edinburgh, he was licensed as a preacher of the established church in 1759, and in 1762 was ordained minister of Kirkcudbright. The determined resistance of the congregation to the appointment, based apparently on his too philosophical and "moderate" style of preaching (joined perhaps to the fact that he was the intimate friend of David Hume), led to a litigation, to his sensitive mind extremely distressing, and he resigned the charge in consideration of a small annuity. After this, he resided in Edinburgh till his death, occupied chiefly in superintending the education of a limited number of boarders, a charge for which his varied accomplishments and benign manners peculiarly qualified him. He will, however, be best remembered in connection with that famous letter of his which happily arrested Robert Burns on the eve of his departure for the West Indies, and thus, to all human appearance, saved from oblivion the greatest lyrist that the world has seen. A collected edition of his poems was published in 1793, with a biographical sketch by Henry Mackenzie.

BLACK-MAIL, a scarcely voluntary impost submitted to, in the earlier half of the 18th c., by the people of the Highlands, and parts of the Lowlands bordering on the Highlands, as a kind of compromise with robbers. The districts in question, being then in an extremely barbarous state, enjoyed but an imperfect protection from the law. Owing, moreover, in part, to political and social circumstances, theft and robbery were not then regarded in the Highlands as they are now: to carry off the cattle of a neighbor was perhaps only wreaking out an old family quarrel or clan dispute, or making reprisals for some severity of persons in power. Certain it is that men of good standing gave a certain degree of protection to notorious cattle-lifters. In these circumstances, a class of men rose up who professed to take upon themselves the duty of protecting the property of individuals, on the payment by them of a percentage on their rents, generally 4 per cent. They were not low men who did so; nearly all of them had good Highland pedigrees, and passed externally as honorable persons, though there was only too great reason to suspect that they encouraged and profited by robberies, in order to make the black-mail a necessity. The celebrated Rob Roy was, about 1730, a notable levier of black-mail in the southern Highlands and adjacent Lowland districts. A little later, Coll

M'Donell of Barrisdale, a cadet of the Glengarry family, was equally noted further north. When one of the payers of the black-mail suffered what was called a *hership*, the levier of the impost, being quickly informed of what had happened, busied himself to recover the lost cattle, and if he failed, he held himself bound to pay an equivalent. We are informed by Mr. Lapslie, the minister of Campsie, Stirlingshire, in his statistical account of the parish, 1795, that his father, John Lapslie, was a farmer who paid black-mail in 1744 to M'Gregor of Glengye, the nephew of Rob Roy. The engagement was that he should make good losses, if the number of sheep stolen exceeded 7, for anything less was held as not a *hership* or *lifting*, but merely a *picking*. Early in 1745, 15 were stolen, and M'Gregor was honorably preparing to replace them, when the breaking out of the rebellion, in which he became involved, deprived him of the power of fulfilling his engagement, and likewise put an end to his self-created wardenship of the Highland borders. After that period, law was vigorously enforced in the Highlands, and black-mail ceased to be heard of.

BLACKMAN, GEORGE CURTIS, 1819–71; b. Conn., d. Ohio; graduate of the New York college of physicians and surgeons. In 1854 he became professor of surgery in the medical college of Ohio (Cincinnati), where he was known as a bold and skilful operator in some very difficult surgical cases. He was medical officer in the civil war, and was present at the battles of Shiloh and the Wilderness. He edited Velpeau's *Surgery*, with notes and additions.

BLACK MONDAY, the Easter Monday in 1351, when hail fell, and many people in England perished from cold. Also the Easter Monday (April 14, 1360) when Edward III. of England was with his army lying before Paris; a day so cold, dark, and stormy that many of his men and horses died from the effects. Shakespeare speaks of B.M. "It was not for nothing that my nose fell a-bleeding on black Monday last" (*Merchant of Venice*). In Australia, Feb. 27, 1865, got this name from a terrible sirocco that made great havoc over a wild region.

BLACKMORE, Sir RICHARD, one of the court physicians in the reigns of William III. and Anne, is remembered as the most heavy and voluminous poetaster of his own or any other age. He appears to have been a good and well-meaning man, and the merciless ridicule of contemporary wits was due, in some part at least, to the moral and religious tone of his works, and to his free censures of the libertinism of the time. But the worthlessness of the poems has been amply confirmed by the judgment of posterity. *The Creation*, considered his best, Addison pronounces "one of the most useful and noble productions in our English verse;" but few modern readers are likely to examine the grounds of this judgment, still less to agree with it. B. wrote six epics (choosing always the loftiest themes)—viz., *Prince Arthur*, in 10 books; *King Arthur*, in 12; *Eliza*, in 10; *Creation*, in 7; *Redemption*, in 6; *Alfred*, in 12; besides *The Nature of Man*, 3 books; a new version of the Psalms, paraphrases of Job, and other parts of the Bible, and a long list of theological, medical, and miscellaneous treatises.

BLACK MOUNTAINS, a portion of the Appalachians in North Carolina so called because of their dense evergreen vegetation. Some of the measurements are: Mt. Mitchell or Clingman's peak, 6701 ft. above tide; Guyot's peak, 6661; Sandoz Knob, 6612. Recent measurements show that there are about a dozen peaks in the B.M. that are higher than Mt. Washington (N. H.), whose elevation, 6285 ft., has usually been considered the highest e. of the Mississippi.

BLACK OAK, *Quercus tinctoria*, a species of oak valuable for the tannin furnished by its thick yellow bark, which yields quercitron. Sometimes it is called dyer's or yellow oak.

BLACKPOOL, a flourishing t. in the township of Layton-cum-Warbreck, in the co. of Lancaster, is now a very considerable place, lying on the coast of the Irish sea, between the estuaries of the Ribble and the Lune, distant from Poulton-le-Fylde 4 m., and from Preston 18 miles. The population in 1861 was 3506, and in 1871 it had increased to 6100; but the numbers who resort here during the bathing-season far exceed the permanently resident inhabitants. Upwards of 100,000 visitors annually come from e. Lancashire, Manchester, Yorkshire, and other parts of the kingdom. B. is one of the most frequented bathing-places in the w. of England, the sands being excellent. It has a branch railway connecting it with the Preston and Wyre railway, which affords easy access from Preston, Liverpool, Manchester, and all parts of the kingdom. There is also another railway connecting it with Lytham, another favorite bathing-place on the Ribble, about 7 m. to the south. B. has a fine pier, furnishing sitting accommodation to upwards of 3000 persons, which cost about £25,000; and a second, more recently opened, 500 yards in length. There are three established churches, a Roman Catholic chapel, and five other chapels for the Wesleyans, Independents, etc. Besides excellent streets and terraces of houses elegantly built, it has many large hotels (one of which, recently erected, cost upwards of £12,000); there is also a theater, libraries, news-rooms, etc. There is no trade or manufactures; the lodging-house keepers depend solely on the large concourse of visitors. Fishing is the employment of many during the winter months.

BLACK PRINCE, the name usually given in history to Edward Prince of Wales, son of Edward III. (q.v.).

BLACK QUARTER, syn. *Black Spald, Black Leg, Quarter Evil, Blood Striking;* incorrectly termed by some English writers *Inflammatory Fever*—termed by others *Hæmatosepsis* (Simonds) *Hæmatoclysis.*

Definition.—An apoplectic disease peculiar to cattle; a form of carbuncular disease, or anthrax—enzootic, i.e., limited to districts; not spread by contagion, but attended, especially in warm climates, and in Great Britain in hot weather, with the development of a blood-poison destructive to man and the lower animals. See MALIGNANT PUSTULE.

Causes.—Rich pasture on stiff, retentive, and undrained soil; sudden changes from poor to rich keep, particularly with animals in good health, predisposed to make blood or fatten fast. Youth predisposes to the disease, from the greater activity of the nutritive functions in early life. It is a disease confined almost entirely to yearling and two-year-old animals; the writer has, however, seen it in aged cows, etc. A young animal, thriving fast, may suddenly be seized with B. Q., if exposed to cold, showers, or a storm. A check thus induced to the organs of secretion, and particularly to the action of the skin, at once produces the blood-charge and apoplectic effusion peculiar to the disease. In various countries where calves are reared by the hand, and not allowed to suckle their mothers, there are many cases of quarter ill when the young animals are transferred from the stable or bare fields to rich grass-lands. The malady is chiefly witnessed in spring and autumn, particularly when animals are fed on strong autumn grass.

Symptoms.—The premonitory signs are often very insignificant, and usually overlooked. The healthy thriving aspect of a young steer, in a district where the disease prevails, excites the suspicion of the farmer. The animal may be observed with a sleek coat, voracious appetite, quick staring look, suddenly to stop feeding; the eyes become bloodshot; there is slight salivation or foaming at the mouth; and in the space of an hour or less, it will fall helpless, having manifested slight lameness in one of the limbs before dropping. In other cases, the animal suffers from swelling and pains, suddenly developed in one of the joints, whether the fetlocks, knees, or hocks, elbow, shoulder, or stifle. The swelling extends, and the animal falls. In both cases, the limb or *quarter* of the animal affected swells, the skin is bluish, the veins of the part are distended by black blood, and the creature is perfectly helpless. The suffering is unusually acute; but in many instances the respiration is tranquil, the pulse, however, oppressed and frequent. Animals in this state are costive at first, but occasionally violent diarrhœa supervenes, and the excrement is tinged by black extravasated blood. Death almost invariably supervenes in from 4 to 48 hours. Some cases prove lingering, especially if active and proper treatment be employed early; but recovery is rare. The symptoms of approaching death are convulsive twitchings of the muscles, fixed haggard look, grinding with the teeth, and spasmodic breathing. In some cases, the animal appears quite paralytic, and quietly breathes its last.

Post-mortem appearances.—The quarter affected is found, when cut into, soaked in black semi-coagulated blood. Similar blood is found in all the vessels of the body, and all the tissues have consequently a black congested appearance, particularly the lungs. The heart, as in all blood-diseases, is stained both externally and internally by black blood, effused beneath its serous covering or lining, and this appearance has led some veterinarians to believe the immediate cause of death to be inflammation of the heart. Such is not the case. The blood extravasations indicate the peculiar condition of the circulating fluid. In some cases in which a joint has been affected some hours before severe constitutional symptoms have appeared, the tissues around the joints are infiltrated by a yellow semi-solid exudation or lymph, which is capable of producing malignant pustule if inoculated in man or animals. Abscesses and sloughs are occasionally met with in and around the diseased joints.

Treatment.—In the earliest stage, blood-letting to the extent of 5 or 6 quarts. Administer half-ounce doses of niter in solution every half-hour for 4 or 5 hours. Give the animal much water to drink, and if chances of recovery are observed, 4-oz. doses of Mindererus's spirit, or solution of the acetate of ammonia, must be given every 4 hours. As the animal rallies, it may be desirable to administer a mild purge of Epsom or Glauber salts. The local treatment consists in incisions into the swollen parts, care being taken that the joints are not penetrated. The incisions must be washed with the following lotion: Chloride of zinc, 1 drachm; water, 12 ozs.; dissolve and apply with linen rag or lint, confining the moisture by gutta-percha or oil-silk. Treatment is not often successful, but we have the greatest facilities for

Prevention by deep drâining, whereby many pasture-lands have been rendered perfectly safe—after having repeatedly ruined tenant-farmers—from destruction by black quarter. In some hill-lands, where drainage does not appear the cause, the malady may be prevented by giving to all the cattle on the farm a weekly dose of an ounce of niter. The animals that thrive most rapidly should have the medicine rather more frequently, though not to such an extent as to reduce their condition.

The flesh of animals dying from this disease should not be used for human food. It

has destroyed whole families, and though in this cold climate accidents are rare, nevertheless they have occurred. Butchers have lost their arms, and persons have lost their lives from being inoculated in cutting up meat from oxen that have died of quarter ill.

BLACK RIVER, in n. New York, rising in the western part of the Adirondack region and running w. and n. to lake Ontario. In its course there are numerous falls and rapids furnishing abundant water-power to half a dozen villages, and the city of Watertown. The color of the water is about that of sherry wine. Boats pass from this river to the Erie canal through the Black river canal.

BLACK RIVER, or BIG BLACK, an affluent of White river, in Mo., flowing s. to the Arkansas border; about 350 m. long, and navigable for about 100 m. except in the dry season.

BLACK ROD, USHER OF THE, an officer of the house of lords, appointed by letters-patent. He is chief gentleman-usher to the sovereign, and belongs to the order of the Garter. His principal duty is (himself, or by his deputy the yeoman-usher) to summon the house of commons to the peers when the royal assent is given to bills, or when royal speeches are read; and to take into custody any peer guilty of breach of privilege. His income is devived from certain fees under the regulation of the house; and the appointment of messengers, door-keepers, servants, etc., rests with him. This patronage was at one time very lucrative, but new arrangements have made it much less so.

BLACK ROOD OF SCOTLAND. When the Anglo-Saxon princess who became the wife of king Malcolm Ceanmohr landed in Scotland, about the year 1070, she brought with her what was regarded as a priceless relic—a cross of gold, elaborately wrought, in the form of a casket, about a span long, containing what was believed to be a piece of the true cross, set in an ebony figure of the Saviour, richly decorated with gold. Of its earlier history, nothing is known; but St. Margaret bequeathed it as an inheritance to her children, and as she herself was at the point of death, we are told by her confessor, that she had it brought to her bedside, when she pressed it to her eyes and lips, and expired, clasping it with both her hands. The contemporary biographer of her son, king David I., relates that "the Black Rood of Scotland," as it was called, received the dying adoration of that saintly prince, and that it had then (in the middle of the 12th c.) come to be regarded by the whole nation of the Scots with mingled feelings of love and awe. It was kept as an heirloom of the kingdom, in the royal treasury in the castle of Edinburgh, and along with the other regalia and muniments of Scotland, was delivered up to king Edward I. in 1291. The irreverent scrutiny of the officers of the English king discovered that the outer case, which to the eyes of St. Aelred, in the previous century, seemed to be of the purest gold, was only silver gilt. But the relic itself was not the less venerable on that account; and it was used by king Edward to give increased solemnity to the oaths of fealty which he exacted from the magnates of Scotland. Thus, when the bishops of St. Andrews and of Glasgow sided with Bruce, it was urged as a heinous aggravation of their guilt, that they had sworn "upon the body of Christ (i.e., the sacrament of the eucharist), and upon the holy gospels, and upon the cross of St. Neot, and upon the B. R. of S.," to be true and faithful to the English king and his heirs for ever. When the long struggle between England and Scotland was at last ended by the peace of Northampton in 1328, the Black Rood was restored to Scotland as one of the national treasures. But it was not destined to remain long in the north. When the hapless king David II. invaded England in 1346, he carried the black rood with him, in the belief (common in that age) that such a holy relic would insure safety to his person or victory to his arms. On his defeat and capture under the walls of Durham, the B. R. of S. became the prize of his conqueror, sir Ralph de Neville, lord of Raby, by whom, along with other spoils of the battle, it was offered up at the shrine of St. Cuthbert, in the cathedral of Durham. There it hung till the reformation, when all trace of it disappears.

BLACK, or EUXINE SEA (the *Pontus Euxinus*), or "hospitable sea" of the ancients, the Kara Deniz of the Turks, the Mauri Thalassa of the modern Greeks, and the Tschernoje Moré of the Russians) is an inland sea lying between Europe and Asia, extending from lat. 40° 45′ to 46° 45′ n., and from long. 27° 30′ to 41° 50′ east. In shape it bears a certain resemblance to the human foot. Its greatest length from e. to w., on the 42d parallel, is about 700 m., and its greatest breadth, near the w. end, about 380 miles. Area, 172,000 sq. miles. On the south-western extremity it communicates by the Bosporus, the sea of Marmora, and the Dardanelles, with the Mediterranean, and on the n.e. by the straits of Yenikale with the sea of Azof. The B. S. drains nearly one fourth of the surface of Europe, and also about 100,000 sq.m. of Asia. Throughout its whole extent it has but one island, and that a small one, lying opposite the mouths of the Danube, called *Adassi*, or isle of serpents, on which is a light-house. The continued occupation of this island by the Russians, in defiance of the stipulations of the treaty signed at Paris after the termination of the Crimean war, occasioned considerable uneasiness in Turkey, and detained a British fleet in the B. S. for several months. In the center of the B. S. there are no soundings at 150 fathoms, nor are there shoals along the shores, except at the entrance of the Bosporus; the navigation of the B. S. ought, therefore, to be particularly easy and safe. It is so in summer; but in winter, being inclosed on

every side, it becomes the scene of conflicting winds, and of storms which, though of short duration, are terrible while they last. Such a storm it was on the 14th of Nov., 1854, in which about forty vessels of the allies were either totally wrecked or very seriously injured; nearly 1000 lives were lost, and property worth some millions destroyed.

All the coasts are high, with good harbors, except between the mouths of the Danube and the Crimea; there the land is low, and the danger of navigation greatly increased in winter by the presence of floating ice; for, from the many large rivers which flow into the B. S. and sea of Azof (Danube, Dniester, Bug, Dnieper, Don, and Kuban, in Europe; and the Kizil-Irmak and Sakara in Asia), the waters are fresher, and consequently more easily frozen than those of the Mediterranean. The specific gravity of the water of the B. S. is 1014 (water being = 1000), while that of the Mediterranean is 1028. The shores from Odessa to the Crimea are ice-bound during Jan. and Feb.; and although the harbor of Odessa is never frozen up, yet the drift-ice frequently renders the entrance to it dangerous.

There is no tide in the B. S., but the large rivers flowing into it give rise to currents, which are particularly strong in spring when the snows melt, and the accumulated moisture of the whole winter is drained off the land. The great current which, passing out of the sea of Azof round the Crimea, flows first in a south-westerly, then in a north-westerly direction, and again due west, is turned southwards by a current from the Dnieper and Dniester; the two currents are afterwards met by another from the Danube, and then, all united, rush towards the Bosporus. The Bosporus, however, is not wide enough to admit the entire volume of water pressing into it; and a portion of the main current is consequently diverted to the coast of Asia, where it is strengthened by new accessions. This, which is the normal course of the currents in the B. S., is modified by the winds, and by local circumstances. In some bays of Roumelia and Bulgaria counter-currents have been observed. The most important ports on the B. S. are those of Odessa, Kherson, Eupatoria, Sebastopol, Batum, Trebizond, Samsun, Sinope, Varna, etc.

The depth of the water is unfavorable to the extensive establishment of fisheries, but several kinds of sturgeon are caught in considerable quantities in the straits of Yenikale. Other fish of various kinds are said to be abundant.

The ancients believed that the B. S. was at one time much more extensive, and that it had no connection with the Mediterranean. They accounted for its decrease and communication with the larger sea by the supposition that the Thracian Bosporus had been burst through by an earthquake, or by the great deluge known as the Deucalion deluge, which inundated Greece. The B. S. being higher than the Mediterranean, the latter, of course through the newly created channel, became the basin for much of its waters. Certain geological and other appearances have led some modern geographers to entertain an opinion similar to that of the old Greeks, which, however, is not shared in by others.

The B. S. has been navigated from a very early period. Its original name (supposed to have arisen from the dangers such an expanse of sea offered to early navigation, as well as from the fact that savage tribes dwelt upon its coasts) was *Axine*, or "inhospitable" sea, afterwards changed by the Greeks to *Euxinus*. In the time of Xerxes, large quantities of corn were exported from its ports to Athens and the Peloponnesus. The Romans and Byzantine emperors, and also the Genoese, had large traffic on the Black sea. When the Turks captured Constantinople, all but their own ships were excluded from its waters until the treaty of Kinarji, 1774, when the Russians obtained the right to trade in it. Ten years after, Austrian ships were privileged to trade here; and by the peace of Amiens, in 1802, British and French ships were admitted. The undue preponderance of Russia in the B. S. was the main cause of the Crimean war.

BLACK SILVER, an ore of sulphur, antimony, and silver, found with other silver ores in Saxony, in the Hartz mountains, in Mexico, in the Comstock lode (Nevada), in Idaho, and other places. It is sometimes called Stephanite, and its composition is sulphur, 16.2; antimony, 15.3; silver, 68 5.

BLACK SNAKE, (*coluber constrictor*, see COLUBER), a species of snake common in the United States of America, from Louisiana to Connecticut. It is of an almost uniform leaden color, is one of the largest serpents in North America, and is remarkable for its great agility. It moves along the ground with a swiftness equal to that of a horse, glides over bushes, and climbs trees. It feeds on small quadrupeds, birds, frogs, etc.; frequently plunders poultry-yards of eggs; and enters dairies to drink milk or cream, of which it is very fond, but compensates for these depredations by killing rats and mice. It has no poison-fangs, but is not slow to bite. It is very capable of domestication.

BLACKSTONE, a t. in Worcester co., Mass., 36 m. s.w. of Boston; on the Providence and Worcester, and Boston, Hartford and Erie railroads; pop. '80, 4,908. The chief business is cotton and woolen manufacturing.

BLACKSTONE, WILLIAM, the first white man who settled on the site of the present city of Boston, about 1623. Ten years afterwards he removed to Rhode Island. It is believed that he was an English clergyman, a graduate of Emmanuel college.

BLACKSTONE, Sir WILLIAM, a commentator on English law, was the posthumous son of a silk-mercer in London, and was born there on the 10th of July, 1723. At the age of 15, having obtained a scholarship from the charterhouse school, where he was educated,

he was sent to Pembroke hall, Oxford. There he was fortunate enough to obtain a second scholarship, and remained till, in 1744, he was admitted a fellow of All Souls' college, when he removed to London, to attend the courts of law with the view of qualifying himself for his future profession. In 1746, at the age of 23, he was called to the bar, but failed to attract either notice or practice. Upon the death of an uncle in 1749, he was appointed recorder of Wallingford, in Berkshire; but in 1753 he went to Oxford, where he delivered a course of academic lectures upon the law of England. A few years later, a Mr. Viner having left a sum of money to endow a chair of English law in the university of Oxford, B. was, in 1758, appointed first Vinerian professor. The following year, B. returned to Westminster; and as the doctrines which he had taught as a lecturer had been such as to commend him to the notice of the tory government of that day, he obtained its patronage, and in 1761 was made a king's counsel. Shortly after, he was appointed principal of New Inn hall, Oxford. Other honors followed fast, and he became successively member of parliament, bencher of the Middle Temple, and solicitor-general to the queen. In 1765, B. published the first volume of his lectures, and the remaining three volumes between that date and 1769. These lectures form his celebrated *Commentaries on the Laws of England*. His practice continuing to increase, he resigned, in 1766, his Oxford appointments. Four years later, he was offered the solicitor-generalship, and after declining it, was knighted, and made a justice of the court of common pleas. The remaining years of his life were spent in the discharge of his duties as a judge. He died on the 14th of Feb., 1780, at the age of fifty-seven.

The fame of B. rests entirely upon his *Commentaries*. His other literary works were inconsiderable, and his merits as a pleader or judge were not such as, of themselves, to have made his reputation outlive himself. As a commentator, he had many excellences. His style was in general clear and gracefully ornate, and his illustrations pleasing and felicitous. While he confined himself to exposition—to the accurate statement in scholarlike English of what had heretofore lain buried in the cumbrous language of lawyers like Littleton—B. was unsurpassed, and rendered an important service to the country. But he was ambitious of combining with this exposition the higher task of explaining the reasons for the law, as well as its merits and defects. For this survey of the law, from the legislator's point of view, he had not the requisite qualifications. His knowledge of English history was, as Hallam tells us, superficial, and his study of the philosophy of law had been imperfect. With the works, indeed, of Montesquieu and Beccaria he was acquainted; but the mode in which he quotes them shows that he had imbibed nothing of their spirit. The method followed in the *Commentaries* was as unscientific as could be imagined, and had not even the merit of originality. It was taken, with little alteration, and no improvement, from Sir Matthew Hale's *Analysis of the English Law*. Possibly the haste with which the *Commentaries* must have been composed, being originally in the form of lectures, may have led to some of their imperfections. Since B.'s death, the *Commentaries* have been very frequently reprinted, perhaps the best editions being those of Christian. As a century has elapsed since they were composed, so many alterations are requisite to adapt them to the existing state of the law, that it may be said that their purpose has been served, and that they are now valuable chiefly as materials for history.

BLACK STONE EXAMINATION. See GLASGOW UNIVERSITY.

BLACKSTONE RIVER, rises in Worcester co., Mass., and runs into Rhode Island, where its name is changed to the Pawtucket. It furnishes water-power to a continuous line of villages and hamlets along its shores. The B. canal, finished in 1823, is disused, having been supplanted by railroads.

BLACK VOMIT, the dark mucous matter thrown up in yellow fever, and usually a sign of fatal termination of the disease. It is in part coagulated blood blackened by an acid generated in the system. The fever itself is often called the black vomit.

BLACK WAD is a name given by miners to the native black oxide of manganese, and principally to an impure and earthy variety of the ore. See MANGANESE.

BLACKWALL, a suburb of London, in Middlesex, at the junction of the Lee with the Thames, 4 m. e.s.e. of the metropolis. It has foundries, ship-building yards, and the East and West India docks. A railway 4 m. long, mostly on a brick viaduct above the streets, connects B. with the city of London. To avoid the dangers and delay of the "pool," many passengers proceed by this railway to embark in steamers at B., instead of going on board at London bridge.

BLACK WARRIOR, a river formed in the n. of Alabama, by the junction of the Mulberry and the Locust. Almost from the very point of confluence it is navigable for steam-boats, till, after a course of more than 150 m., it enters the Tombigbee, which, again, is navigable for large vessels all the way to Mobile on the gulf of Mexico, a stretch of nearly 200 m. more. Its banks yield coal, iron, and other valuable minerals.

BLACK WATCH, the appellation given to certain armed companies employed to watch the highlands of Scotland. The term *black* arose from the dress of this species of militia, which was composed of tartans of dark colors. Some highlanders had been armed by government as early as 1725, when gen. Wade was appointed commander-in-chief in Scotland; but it was not till about 1729 or 1730 that the companies assumed a regular

form. The companies were six in number—three comprising 100 men each, commanded by a captain; and three of 70 men each, commanded by capt.-lieuts. Stationed in different parts of the highlands, and acting independently of each other, they were styled the independent companies of the black watch. The body was raised chiefly from the whig or loyal clans—Campbells, Grants, Munros, etc.—and many men of good station in society joined it, not only for the sake of good pay, but for the valued privilege of bearing arms. The duties of the B. W. were to enforce the disarming act, to overawe the disaffected, to prevent political meetings of a seditious kind, and to check depredations among the clans, or on the lowland frontier. After being of considerable use for these local purposes, the whole of the companies were formed into the 42d regiment, under the command of the earl of Crawford, in 1739—their removal giving facility, no doubt, for the outbreak of the rebellion in 1745. Retaining its original highland character, the 42d regiment became one of the most distinguished corps in the British army; the whole of its history, for which we would refer to the work of col. Stewart on highland regiments, being a series of brilliant achievements. Embodied under the earl of Crawford, the regiment would have adopted the tartan of that nobleman, if he had possessed such a cognizance; the earl, however, being a lowlander, it was necessary to adopt an arbitrary pattern of tartan, which has ever since been known as the 42d or B. W. tartan. See TARTAN.

BLACK-WATER, a disease in cattle. See DARN.

BLACKWATER, the name of five Irish rivers, two of which deserve notice.—1. The B. of Cork co. rises in the w. of Kerry co.; runs e. across Cork co. and the w. part of Waterford co., in a carboniferous limestone basin, past Millstreet, Mallow, Fermoy, Lismore, and Cappoquin, and enters the sea at Youghal harbor. High mountains bound it on the s., and its chief feeders come from the north. It has a course of 100 m., and is the seventh in size of the Irish rivers. The scenery along its banks is highly beautiful and picturesque, with ruins, mansions, and woods. It is navigable for barges for the last 15 m. of its course. It abounds in salmon.—2. The B. of Ulster rises on the confines of Tyrone and Fermanagh cos.; runs first s.e., and then n.w. through Tyrone; and then between Tyrone, Monaghan, and Armagh, past Caledon and Charlemont, and falls into the s.w. corner of Lough Neagh.

BLACKWELL, ALEXANDER, a physician of great natural genius, son of the Rev. Thomas B., one of the ministers of Aberdeen and principal of Marischal college, was b. in that city in the beginning of the 18th century. He studied physic under Boerhaave at Leyden, where he took the degree of M.D. He was afterwards a printer in London, but becoming bankrupt in 1734, was supported in prison by his wife, who prepared and published a *Herbal* (2 vols. folio, 1737–39) with 500 cuts of plants, drawn, engraved, and colored by herself, her husband adding their Latin names, with a brief description of each. The work, patronized by the college of physicians, met with great success, and B. obtained his release. A work on agriculture, published by him, falling under the notice of the king of Sweden, B. was invited to Stockholm in 1740, and received apartments in the house of the prime minister, with a pension. Having cured the king of a dangerous illness, he was appointed one of the royal physicians; but while in the full enjoyment of court favor, he was charged with being concerned in a plot with count Tessin against the king and government, and after being subjected to the torture, was broken on the wheel, Aug. 9, 1748, protesting his innocence to the last. A genus of plants, *Blackwellia*, is named in honor of Mrs. Blackwell.

BLACKWELL, ANTOINETTE L. BROWN, b. 1825. She studied theology at Oberlin, and was ordained pastor of a Congregational church in 1853. She retired from this work after a few years, and is a prominent leader in "woman's rights" and other social questions. She married Samuel C. Blackwell in 1856.

BLACKWELL, ELIZABETH, M.D., a medical practitioner in New York, U.S.—the first woman that ever obtained a medical diploma—was b. at Bristol, where her father carried on an extensive business as a sugar-refiner, in the year 1821. Circumstances afterwards induced the family to emigrate to New York, and then to push west to Cincinnati, where, in 1838, the father died, leaving a widow and family of nine children but scantily provided for. Miss B., who was at this time in her 18th year, and who had already been distinguished by unusual decision of character, immediately, along with two elder sisters, opened a boarding-school, which soon gained a reputation, and had a large attendance. But the spirit of Miss B. chafed at the limitations which society had imposed on the energies of women, and she often took counsel with her sisters as to the practicability of storming the learned professions, and thus enlarging woman's sphere. At length, in 1844, the school was given up, Miss B. determining to become the medical apostle of her sex. After three years' further work as a salaried teacher, which she undertook in order that she might have the pecuniary means wherewith to prosecute her medical studies, and during which time she devoted the whole of her leisure to the study of medical and anatomical books, she went to Philadelphia, where she applied in vain for admission into the medical schools. Failing this, she entered on a course of private anatomical study and dissection and of midwifery with prof. Allen and Dr. Warrington of Philadelphia. After strenuous efforts, she at last obtained admission to

a university—that of Geneva, in New York state—and thither she accordingly repaired in the Nov. of 1847. Here she remained until Jan., 1849, when she graduated with the highest honor. During the two years of her study, she conducted herself with a propriety and discretion that gained for her the esteem and respect of all her fellow-students. Only once was an insult offered to her. It was in the class-room, and she repelled it with so quiet a dignity as to bring down the applause of the students on herself, and their hisses on her despicable assailant. Her presence had a beneficial effect upon the students; her "brilliant example," as the president called it, had stimulated them to greater effort, and their general conduct and attainments during the sessions she was at college were better than usual. Shortly after her graduation, Miss B. visited Europe, in order to the further prosecution of her medical studies. At Paris, she was told that it would be impossible for her to gain entrance to the schools or hospitals there, unless she adopted male attire; a suggestion which she refused to act on, as it was alike repugnant to her taste, and to the great object she had in view—viz., the recognition of female doctors. After much perseverance, she was at length admitted into the extensive lying-in hospital of the *Maternité*, and was permitted to visit other hospitals. After studying at St. Bartholomew's hospital, and the Woman's hospital, London, she returned to New York in 1851, and there established herself in practice. At first difficulties were thrown in her way by physicians of the opposite sex refusing to meet her in consultation; but these were soon overcome, and Miss B. was soon established in excellent practice. In 1852, she delivered a series of lectures to ladies on health and physical development; in the following year she published a work, entitled *The Laws of Life, considered with Reference to the Physical Education of Girls*, and also established a dispensary for women and children, which proved so successful that she was induced, in 1857, to open a small hospital for women. Miss B.'s sister, now Dr. Emily B., has followed in the footsteps of Elizabeth.

BLACKWELL, Lucy Stone, b. Mass., 1818; graduated at Oberlin college. She took an early interest in the anti-slavery cause, and was prominent in the work as a lecturer and agent. In 1855, she was married to Henry B. Blackwell, an English gentleman. Since that time she has resided in Orange, N. J., and is now in Dorchester, Mass. She is known as an ardent advocate of suffrage and other rights for women.

BLACKWELL, Thomas, a scholar of some eminence, brother of Alexander B. (q.v.), b. at Aberdeen, Aug. 4, 1701, studied Greek and philosophy in Marischal college, and took the degree of M.A. in 1718. In Dec., 1723, he was appointed professor of Greek in Marischal college, and in 1737 published anonymously at London an *Inquiry into the Life and Writings of Homer*, 8vo, 2d edition, 1746, and shortly afterwards, *Proofs of the Inquiry into Homer's Life and Writings*. In 1748, he published, also anonymously, *Letters concerning Mythology*, 8vo. The same year he was made principal of Marischal college; and at the commencement of the session 1752, on his recommendation, a new order in teaching the sciences was introduced into the college. In 1753, he published the first volume of his *Memoirs of the Court of Augustus*, 4to. The second volume appeared in 1755; and the third, left unfinished by him, was completed by John Mills in 1764. He died March 8, 1757. A chemical professorship was founded by his widow in Marischal college in 1793, and also a biennial award of £20 (the "Blackwell prize"), open to any one, for the best essay on a subject proposed by the principal and professors of Marischal college.

BLACKWELL'S ISLAND, a narrow strip of rocks in the East river, between New York and Long island, about 1½ m. long by ¼ m. wide; used exclusively for the penal institutions and hospitals under charge of the city of New York. (See New York City.)

BLACKWOOD, William, a distinguished Edinburgh publisher, the originator of *Blackwood's Magazine*, was b. in Edinburgh, Nov. 20, 1776. After serving his apprenticeship to the bookselling business in his native city, and prosecuting his calling in Glasgow and London, he settled in Edinburgh as a bookseller—principally of old books—in 1804. In 1817, at which time he had become a publisher on his own account, he issued the first number of *Blackwood's Magazine*. The literary ability displayed in this periodical was so much in advance of the monthly magazines then existing, that from the first it was a great success. Its remarkable popularity was sustained by the papers of John Wilson (q.v.) and J. G. Lockhart (q.v.), also of James Hogg (q.v.), and other spirits, whom B. had the liberality and tact to attract to his standard. Overwhelming its political and literary opponents, now with the most farcical humor, and now with the bitterest sarcasm—sometimes with reckless injustice—the magazine secured for itself a prodigious reputation, more particularly among the tories, of whose political creed it has always been a resolute adherent. We believe it can hardly be said that *Blackwood's Magazine* has ever had any distinct editor. William Blackwood himself, who added literary tastes and acquirements to his profession of a bookseller, was the chief manager of his magazine, and conducted the whole of the correspondence connected with it until his death, which took place Sept. 16, 1834. Under his sons, the Messrs. B., who succeeded him in the business, *Maga* has not only sustained but increased its reputation; the places of its old contributors are supplied by many of the most distinguished men of letters in the country. In the conduct of the magazine, the late prof. W. E. Aytoun was

understood to occupy a position in relation to the publishers somewhat analogous to that which Wilson held under their father. The publishing business, which includes that of printing the works issued, has been greatly extended by the Messrs. B., who have a name second to none in the kingdom.

BLACKWOOD RIVER, in w. Australia, enters the Hardy inlet, 6 m. to the n.e. of Augusta, in lat. 34° 14′ s., and long. 115° 12′ east. It flows through the counties Durham and Nelson, first to the w., and then to the s., traversing a district of wood and pasturage. It is navigable for boats to a distance of 20 m. from the sea.

BLADDER (urinary) is a bag formed of fibrous membrane externally, muscular fibers in the middle, and mucous membrane for an internal lining. The peritoneum (see ABDOMEN) covers its back. The shape of the B. is somewhat conical, the *apex* being upwards, and the anterior part of the *base* constricted at the commencement of the urethra, called the *neck* of the bladder. On each side, rather below its middle, open the two ducts from the kidneys (the ureters); an imaginary line drawn between them, and from each end of this line others drawn to the neck of the bladder include an equilateral triangle. In this space, which is called the *trigone*, the mucous membrane is not thrown into folds, but is smooth and very sensitive, the slightest touch upon it giving rise to a desire for micturition. The habit of some children to empty their bladders when sleeping on their backs, is supposed to be due to the urine accumulating in this part, as is also the distressing pain of stone.

The B. is situated in the pelvis in adults, but much higher in the young. It is kept in position by four true or membranous ligaments, and false ligaments formed of folds of the peritoneum. The neck of the B. is surrounded by the prostate gland, and here the urethra (q.v.) begins. Like all cavities lined by mucous membrane, the B. is subject to catarrhal inflammations, which are accompanied by an increased secretion of mucus, rendering the urine turbid, frequent and painful desire to micturate, and very great constitutional disturbance. The symptoms may be acute, and must be relieved by local bleeding, and hot fomentations along with opiates; or they may be chronic, when some medicines, as the *uva-ursi* (see ARBUTUS), bucku (q.v.), the preparations of iron, and the mineral acids, are found useful. If there is much mucus, or decomposed urine in the B., it may be washed out with warm water, in which a minute quantity of nitric acid has been dropped. Of course, if there is any known cause for this inflammation, as a stone, it must be removed.

Irritable B. resembles the former disease, but is produced by various causes unaccompanied by inflammation. Some persons, from mere nervousness, are frequently troubled with a desire to pass water; and strange as it may seem, many in this condition never effectually empty their bladders, always leaving a portion, which keeps up the irritation. This condition frequently arises from the habit of retaining the urine so long as to over-distend and weaken the muscular walls of the B.; but it may be induced by general debility, the irritation of worms, cold, or an irritating state of the urine itself. The best treatment is tonics, and soothing the irritability with sedatives. When this irritability is nocturnal, it may be from the patient lying on the back, as explained above; it generally occurs in delicate children, and is more a habit than a disease.

Paralysis of the B. may be the result of accident, or disease of the nervous centers, or over-distension; in this condition the urine accumulates and dribbles away, and must be drawn off by the catheter (q.v.). This dribbling, or *incontinence*, must be carefully distinguished from irritable B., as it is in nearly every case the sign of a distended bladder. *Retention* of the urine may be caused by mechanical obstacles to its exit, by paralysis, or by an absence of volitional power over the muscles. This last is termed *hysterical* retention, and is common in young girls, in persons suffering from sea-sickness, from being in a strange place, an accident, such as a broken leg, etc. If the affection is not encouraged by an officious use of the catheter, the power generally soon returns. Any long-continued difficulty in passing water is generally followed by a thickening of the walls of the B. itself, or *hypertrophy*. The mucous membrane may form pouches in these thickened walls, which is called *sacculated* B., and cancerous diseases, and tubercle, may also attack this organ.

The B. is liable to be ruptured by accident from without, as, for instance, by a blow or hurt from a saddle; and as this accident is usually fatal, it cannot be too carefully guarded against. If the B. is ruptured posteriorly, the accident is always fatal.

BLADDER CAMPION. See SILENE.

BLADDER GREEN. See BUCKTHORN.

BLADDER-NUT, *Staphylea*, a genus of plants which, according to some botanists, is the type of a small natural order, *staphyleaceæ*, by others, united with *celastraceæ*. See SPINDLE TREE. The *staphyleaceæ* have usually opposite pinnate leaves, the leaflets of which, as well as the leaves themselves, have deciduous stipules. The sepals, petals, and stamens are equal (five) in number. Only about 14 species are known, which are found in very different climates, and scattered over the world. They are mostly small trees of rather elegant appearance. The seeds contain a considerable quantity of a fixed oil, which is slightly purgative. The common B. (*staphylea pinnata*) is a native of the e. of Europe, and of temperate parts of Asia, which has been admitted into the British

flora, but has in all probability been introduced as an ornamental tree. It is frequently planted in shrubberies, as is also *S. trifolia*, a North American species with ternate leaves. The wood of both is firm and white, well suited for the purposes of the turner. The seeds may be eaten, but act as a mild aperient. The flower-buds are pickled as capers. The name B. has reference to the curious inflated membranous capsule, and the hard bony *testa* of the seed. The name *staphylea* is from the Greek *staphylē*, a bunch of grapes, and has reference to the racemed flowers.

BLADDERWORT, *Utricularia*, a genus of plants of the natural order *lentibulariaceæ* (q.v.), containing a large number of species, the bright blossoms of which, along with those of water-lilies, etc., adorn the surface of lakes, ditches, and marshes in almost all parts of the world. They are particularly abundant within the tropics, and many are natives of Australia. Britain produces only three species, all of which have yellow flowers. These plants are very interesting from the provision made for the expansion of their flowers above water, although the whole plant is ordinarily submerged. The roots, stems, and even leaves, are furnished with numerous little bladders or vesicles, which are filled with water till it is necessary that the plant should rise for the expansion of the flowers, when they become filled with air; and this again gives place to water after flowering is over, so that the seeds are ripened at the bottom. The bladders, at least of *U. vulgaris*, have an orifice closed by a very thin elastic valve opening inwards. Aquatic insects sometimes enter them, and are imprisoned.

BLADEN, a co. in s.e. North Carolina on Cape Fear and South rivers; traversed by the Carolina Central railroad; 800 sq.m.; pop. '70, 12,831—6102 colored. It is level, with extensive pine-forests; productions, corn, rice, sweet potatoes, etc. Co. seat, Elizabethtown.

BLADENSBURG, a post-t. of Maryland, on the e. branch of the Potomac, and on the Washington and Baltimore railway. It is 6 m. to the n.e. of Washington; and it was here that the battle which decided the fate of that city was won by the British on the 24th Aug., 1814.

BLAEBERRY. See WHORTLEBERRY.

BLAES, a Scottish colliers' name for the shale of the coal-measures, originating apparently from the "blae" or bluish color sometimes noticed in the shale. The term is occasionally used by geologists.

BLAEU, also BLAEUW and BLAUW (Lat. *Cæsius*), the name of a family of learned Dutch publishers who have rendered as important services to literature and art as Aldus, Giunti, Stephanus, or Elzevir, and whose activity spread itself over Europe for a century.

BLAEU, WILH., a mathematician, map-drawer, and publisher, was b. at Alkmaar, in Holland, in 1571. He belonged to the school of Tycho Brahé, and secured a considerable reputation by publishing a terrestrial and a celestial globe, excelling in beauty and accuracy everything that had preceded them; and also several maps, which indicated a comparatively precise knowledge of geography. As a printer, he did not attain the elegance and completeness of Elzevir, but nevertheless his chief publications are marked by a fine external finish, and a praiseworthy correctness. He died 18th Oct., 1638, and left two sons, John and Cornelius, who carried on the business together until the death of the latter in 1650.

BLAEU, JOH., the son of the preceding, was b. at Amsterdam about the beginning of the 17th century. He commenced business on his own account at Amsterdam, but afterwards entered into company with his father. His *Atlas Major*, in 11 vols. of the size in which atlases are published at the present day, is a splendid work. It is full of archæological and geographical information, supplied for each country by men of eminence connected with it. There are many curious plates—among them a representation of Tycho in his observatory—and the maps are extremely valuable from the light they throw on local history. Besides this, he published a series of singularly rich topographical plates and views of towns, which are consulted even to the present day. He died about 1680, leaving three sons, Joh., Wilh., and Peter, the second of whom became a member of the Amsterdam council, while the other two carried on with distinction and success the paternal business. Some of their classical publications, especially Cicero's *Orationes* (1699), are still highly prized.

BLAGOVIESHTCHENSK, a t. in Asiatic Russia, the capital of the province of Amoor, on the A. river and the Dzega; pop. 3107.

BLAINE, EPHRAIM, 1741–1804; commissary general in the revolutionary army under Washington. His exertions during the dreadful winter at Valley Forge went far towards saving the suffering army from starvation.

BLAINE, JAMES GILLESPIE, b. Penn., 1830. His first education was in the common schools, and at the age of 17 he graduated at Washington college in Pennsylvania. Very soon afterwards he removed to Maine, became a writer on the *Kennebec Journal*, one of the leading papers of the state, and within a brief period the editor of the *Portland Advertiser*, one of the oldest and most influential papers in the east. He was an able and accomplished writer, and won an excellent reputation. In the natural course of

editorial life he became a politician, and identified himself with the republican party from its commencement. His first political advancement was to the lower house of the Maine legislature, where he served four years with honor, and increased his rising fame. In his third term he was elected speaker, and so continued for two years. At the outbreak of the war of the rebellion he was among the earliest and most zealous in advocating a vigorous course on the part of the government, and was especially active in raising and organizing troops for the union army. In 1862, he was elected to congress as a republican, and immediately took a place in the front ranks of the party's representatives. His support of the war to preserve the union was no less zealous than that of senator Morton; the preservation of the union was his controlling idea, and he urged it with all his power. He was re-elected in 1864, in 1866, and in 1868. When the struggle was over he was conspicuous in the measures for reconstruction, and he was the author of the proviso that any state in the south should have a full restoration of its original rights and privileges upon the sole condition that it should ratify the amendments to the constitution. During the presidential canvass of 1868, he was among the foremost and most effective of republican advocates, and had the pleasure of carrying his own state by a larger majority than was ever before given for a presidential candidate. In the same year, he was re-chosen to congress by an immense majority. His six years of service in the house of representatives made him the proper successor for speaker, and he was elected. His nomination was made by Elihu B. Washburne, of Illinois, and the vote was—for Blaine, 136; for Kerr (democrat), 57. In 1876, he was elected to the U. S. senate, where he is now one of the most conspicuous members. While this article is in construction Mr. Blaine stands among the foremost of those who are considered probable nominees of the republican party for president of the United States. There are in him certain elements of magnetism that have been unknown since the days of Henry Clay, and no public man has a more ardent and enthusiastic following.

BLAINVILLE, Henri Marie Ducrotay de, a distinguished French zoologist and anatomist, was b. 12th Sept., 1778, at Arques, near Dieppe. At an early period, he went to Paris, where he devoted himself to the study of medicine and the physical sciences, and took the degree of doctor in 1808. Through Cuvier chiefly, he was induced to study natural history and comparative anatomy. In 1812, he was appointed assistant-professor of comparative zoology, anatomy, and physiology in the university of Paris, as well as professor of natural history at the athenæum; in 1825, a member of the institute; and in 1832, successor of Cuvier in the chair of comparative anatomy in the museum of natural history. He died May 1, 1850. B. achieved great success, not only as a teacher, but as an author. Besides various small treatises which appeared in scientific journals, he published many large and valuable works, all of which have greatly advanced our knowledge of the various sciences they treat of; such as *Faune Française* (1821–30), *De l'Organisation des Animaux* (1822), *Cours de Physiologie Générale et Comparée* (1833), *Ostéographie* (1839–49), *Manuel de Malacologie et de Conchyliologie* (1825–27), *Manuel d'Actinologie et de Zoophytologie* (1834–37).

BLAIR, a co. in central Pennsylvania, on the Juniata; intersected by branches of the Pennsylvania railroad; 650 sq.m.; pop. '70, 38,051; in '80, 52,720. The Alleghany and other mountains make the surface very rough, but there are well cultivated valleys, and mines of iron and bituminous coal. Productions chiefly agricultural. Co. seat, Hollidaysburg.

BLAIR, Francis Preston, 1791–1876; b. Virginia; educated at Transylvania university, and studied but never practiced law. By opposing the nullification movement in South Carolina, he attracted the notice of president Andrew Jackson, who induced him to assume the editorship of *The Globe*, a democratic journal started at the seat of government. The paper began 1830, and was controlled by Blair till 1845, when he was offered the mission to Spain. This he declined, and returned to his estate in Maryland, soon afterwards leaving the old democratic party and supporting the free-soil movement, which naturally brought him into the republican party.

BLAIR, Francis Preston, jr., b. Kentucky, 1821; son of Francis Preston, sr.; graduated at Princeton in 1841, and began the practice of law with his father in St. Louis. He was prominent in the free-soil party that supported Van Buren for president, and was for a time editor of the *Missouri Democrat*. In 1852 and 1854 he was elected to the Missouri legislature; in 1856, elected to congress as a republican; and re-elected in 1860 and 1862. He entered the union army in 1861, rose to brig.gen. in 1863, and resigned his seat in congress. He served through the war, being with Sherman on the "march to the sea." In 1866, he was made collector at St. Louis, and Pacific railroad commissioner. In 1868, he abandoned the republicans and became the democratic candidate for vice-president. In 1870, he was sent to the U. S. senate from Missouri, and at the close of his term of service he returned to private life.

BLAIR, Hugh, an eminent Scotch divine and man of letters, was b. at Edinburgh, April 7, 1718. He entered the university of his native city in 1730, where he soon became noted for his diligence; and an *Essay on the Beautiful*, which he wrote when a student, gave his preceptors a high idea of his ability and taste. In Oct., 1741, B. was licensed as a preacher of the Established church; and after occupying successively the churches

of Colessie in Fifeshire, Canongate church in Edinburgh, and Lady Yester's, he was promoted in 1758 to the highest position attainable by a Scotch clergyman—one of the charges of the High church, Edinburgh. His discourses, which display little power or originality of thought, and which derived nothing from the delivery of their author, were greatly admired by "persons of the most distinguished character and eminent rank" in Scotland on account of their polished style. In 1759, B. commenced a series of lectures on *Composition* to classes in the university, and three years afterwards, a new chair of rhetoric and belles-lettres, with a salary of £70 a year, being created by the crown, B. was made professor. He held this appointment until 1783, when he resigned; and in the same year published his *Lectures*, which obtained a reputation far beyond their merits, and one that time has by no means sanctioned. His first volume of *Sermons* appeared in 1777, with the approval of Dr. Johnson, who had read them, and proved a great success. George III. showed his appreciation of them by bestowing on B., in 1780, a pension of £200 a year. He also published three other volumes of *Sermons*, and prepared a fourth, which was printed after his death, which took place Dec. 27, 1799. They were all as successful as the first one. Opinion about their merits has much changed since the date of their publication; they are now considered as moral essays rather than sermons. B.'s critical acumen was not great; he believed in the authenticity of Ossian's poems, which he strenuously defended.

BLAIR, JAMES, D.D., 1656–1743; b. Scotland. He was sent in 1685 by the bishop of London as a missionary to Virginia, and in 1689 was made the highest ecclesiastical officer of the colony. After long efforts, in 1692, he founded William and Mary college, of which he was first president. He was also president of the council of the colony, and rector at Williamsburg. He published many of his sermons and discourses.

BLAIR, MONTGOMERY, b. Kentucky, 1813; son of Francis P., sr.; educated at West Point, and served in the Florida Indian war, but resigned from the army and began the practice of law in St. Louis, where he was U. S. district attorney, and (1843–49) judge of common pleas. He went to Maryland in 1852, and became solicitor in the federal court of claims. In 1857, he was counsel for the plaintiff in the Dred Scott case; the next year president Buchanan removed him from his office of solicitor. In 1861, he was postmaster-general in Lincoln's first cabinet; but went out in 1864, and has since adhered to the democratic party.

BLAIR, or PORT BLAIR, the chief British convict settlement in the Andaman islands Indian ocean), on the s.e. shore of s. Andaman, 11° 42′ n. and 93° e.; settled as a convict depot in 1789. It has one of the best harbors in Asia, and from its position in the bay of Bengal, is a most important naval and military station.

BLAIR, ROBERT, author of *The Grave*, was b. at Edinburgh, where his father was a clergyman, in 1699. After completing his education for the church, and traveling on the continent, he received license, and in 1731 was ordained minister of Athelstaneford, Haddingtonshire, where he lived in easy circumstances till his death, in 1746. He was an accomplished and thoughtful man, devoted considerable attention to natural science, particularly botany, and corresponded on friendly terms with several eminent contemporaries, among others, Watts and Doddridge. To them he submitted the MS. of his poem, which he had written before his ordination. Watts offered it to two publishers, who thought it too heavy for the times, and it remained several years unprinted. It afterwards attained an honorable place in the esteem of those capable of appreciating a masculine, though somewhat gloomy force of thought and imagery, applied to a profoundly suggestive and serious theme. It found a congenial illustrator in William Blake (q.v.) B. was succeeded in his ministerial charge by the author of *Douglas*. His son, Robert Blair, of Avontoun, became lord president of the court of session.

BLAIR-A'THOL, a village in the county of Perth, Scotland, situated at the confluence of the Tilt and Garry, about 30 m. n.n.w. of the city of Perth. Blair castle, the seat of the duke of Athol, is situated here. The larch-trees surrounding it are remarkable alike for their enormous size, and for the fact of their being among the first planted in Scotland.

BLAIR-GOW'RIE, a village in Perthshire, very picturesquely situated on the e. side of a range of hills, on the right bank of the Ericht, 16 m. n.n.e of Perth. It consists chiefly of one winding street. Pop. in '71, 4832. It has flax-spinning and weaving factories, driven by the Ericht. Pure white marble is found in the vicinity. There is a branch railway from Cupar-Angus.

BLAIRSVILLE, a t. in Indiana co., Penn., 53 m. e. of Pittsburgh; on the Pennsylvania railroad, and the Pennsylvania canal; pop. '70, 1054. It is an important point for shipping country produce by canal and rail.

BLAKE, GEORGE SMITH, 1803–71; b. Massachusetts; commodore in the U. S. navy. He was a midshipman in 1818; lieut. in 1827; commander in 1847; fleet capt. and commander in the Mediterranean three years; capt. in 1855; superintendent of the naval academy during the civil war; and afterwards commodore and inspector of lighthouses.

BLAKE, JOHN LAURIS, D.D., 1788–1857; b. New Hampshire; graduate of Brown university; licensed by the Rhode Island association as a Congregational minister, but early

united with the Episcopal church. He established a seminary for young ladies in Concord, which was removed to Boston in 1822, where he had charge of St. Matthew's church. He edited the *Literary Advertiser* and the *Gospel Advocate*, and published the *Text-Book of Geography and Chronology, Biographical Dictionary, Family Cyclopædia, Letters on Confirmation*, and a number of text-books for schools.

BLAKE, ROBERT, a celebrated English admiral, who, more than any other, contributed to render England mistress of the sea, was b. at Bridgewater, in Somersetshire, where his father was a merchant, in 1598. An ardent republican, and a man of blunt, straightforward manners, singularly devoid of fear, and of inflexible character, he was much respected by Cromwell, with whom, however, he had no very intimate intercourse. When the civil war broke out, he raised a troop in Somersetshire, and took part in all important actions fought against the royalists in the western counties. In 1644, he surprised Taunton, of which place he was made governor, and in that capacity gave proof of no mean military skill. In 1649, in conjunction with two other officers of equal rank, he was appointed general of the sea, the two services at that time not being distinct, as they are now. This was B.'s true sphere, and in it he soon exhibited transcendent ability. After destroying, with the exception of two vessels, the squadron of prince Rupert, which had sought safety in the Tagus in 1651, B. forced the royalists to surrender Guernsey, Jersey, and the Scilly isles. In Mar., 1652, he was made sole admiral of the fleet for nine months, and during this year he fought four engagements with Dutch fleets under Tromp, Ruyter, and De Witt. In the first, on the 19th May, the Dutch retreated under cover of darkness, with the loss of one man-of-war captured, and another sunk. In the next engagement, a squadron of 12 ships, sent to protect the herring-vessels from the attacks of B., were captured; and in the third, on the 28th Sept., 3 Dutch vessels were destroyed, and the rear-admiral taken. On the 29th Nov., a fleet of 80 vessels, under the command of Van Tromp, encountered B. with only 40 off the Goodwin sands. The courageous Englishman scorned to fly even from odds so overwhelming, and the result of the action was the loss of 6 of his ships—2 captured, and 4 destroyed; the rest, in a shattered condition, sought safety in the Thames. Van Tromp now had recourse to that foolish act of bravado with which his name is associated: he tied a broom to the mast-head of his vessel, and sailed through the channel, thus intimating that he had swept English vessels clean out of it. Tromp little knew the indomitable character of B., or of the nation of which he was the worthy representative on the seas. By Feb., 1653, B. was at sea again with 80 ships, and falling in with Van Tromp with about an equal force, he at once attacked him, and after a three days' running-fight, the Dutchman was fain to seek shelter in the shallow waters of Calais—where the greater draught of the English ships did not admit of their following—with a loss of 11 men-of-war, and 30 of a fleet of merchantmen he had in convoy. The English lost only one ship. On the 3d and 4th of June, B. and his coadjutors, Deane and Monk, won another victory over Van Tromp; but ill-health prevented B. from taking part in the engagement of the 29th July, which finally shattered the naval supremacy of Holland. In 1654, B. was appointed by Cromwell to command an English fleet in the Mediterranean, where he soon made the British flag respected by Dutch, Spanish, and French alike. The dey of Tunis refused to do it reverence. B. attacked his capital, burned the Turkish fleet of nine ships which lay before it, accomplished a landing, and with a body of about 1000 men, annihilated an army of 3000 Turks. He next sailed to Algiers and Tripoli, landed, and set free all the English who were detained as slaves. He concluded alliances highly favorable to England with Venice and Tuscany. In 1657, he defeated the Spaniards at Santa Cruz. This was perhaps one of the most daring actions in B.'s memorable career. With a wind blowing right into the bay—which was very strongly defended—B. dashed in, attacked and destroyed the Spanish galleons and shipping in the harbor, and, the wind fortunately changing, sailed out again with a loss of only one ship and 200 men. The Spanish loss in men and property was immense, and the terror the action inspired insured increased respect to the English flag. His health now failed; he returned to England, and died, as his ship entered the harbor of Plymouth, in the year 1657. Cromwell honored his memory by a solemn funeral procession, and caused him to be interred in Westminster abbey. His skill and courage were equaled only by his disinterested patriotism, sterling honesty, and love of justice; he not only gained a decided superiority over England's mightiest naval opponent, but, by the bold tactics he introduced, infused that spirit of enterprise which has ever since distinguished the British navy.

BLAKE, WILLIAM, a celebrated engraver and poet, was b. in London, 1757. In 1789, he published *Songs of Innocence and of Experience, showing the Two Contrary States of the Human Soul*, with about 60 etchings, remarkable for their peculiar and original manner. The poems were equally singular, but many of them exhibited true pathos. Some marginal designs for Young's *Night Thoughts*, executed by B., were greatly admired by Flaxman. B. lived in the full belief that he held converse with the spirits of the departed great—among others, with those of Moses, Homer, Virgil, Dante, and Milton. He published numerous etchings, chiefly of religious and cognate subjects, among the best of which are his *Illustrations of the Book of Job*, and the illustrations of Blair's *Grave*. He died (Aug. 12, 1828) in poverty and obscurity, with the conviction

that he was a martyr to poetic art. Charles Lamb regarded him as "one of the most extraordinary persons of the age;" and A. C. Swinburne said of him that he was "the single Englishman of supreme and simple poetic genius of his time." See *Life of B.*, by Alex. Gilchrist (1863); *William B.*, by Swinburne (1868); and *Poetical Works*, edited by W. M. Rossetti (1874).

BLAKE, WILLIAM PHIPPS, b. New York, 1826; graduate of the Sheffield scientific school; geologist of the Pacific railroad exploring expedition of 1853, and author of a portion of the reports; edited the *Mining Magazine;* in 1861–63 mining engineer for Japan; in the latter year appointed professor of mineralogy, etc., in the college of California, and geologist to the state board of agriculture. He was commissioner for that state in the Paris exposition; executive commissioner for Connecticut in the centennial exposition, and special agent to Vienna in 1873. He has published *Silver Ores and Silver Mines, Report on the Production of Precious Metals, Mining Machinery*, etc.

BLAKELY, JOHNSTON, 1781–1814; b. Ireland. He was educated at the university of North Carolina, and went into the American navy in 1890. In 1813, he was commander of the *Wasp*, a new sloop of war. In his first cruise he captured the English sloop *Reindeer*, taking his prize into L'Orient. On another cruise he made several prizes, and captured the *Avon* and the *Atalanta*. The *Wasp* was spoken Oct. 9, 1814, but was never afterwards heard from.

BLAKEY, ROBERT, b. England, 1795; metaphysician and author. He has published *The Freedom of the Divine and Human Wills, History of Moral Science, History of the Philosophy of the Mind, Historical Sketch of Logic, History of Political Literature*, and some works on religious topics, and sporting. In 1835, he was appointed professor of logic and metaphysics in Queen's college, Belfast.

BLANC, LE, a t. of France, in the department of the Indre, with a beautiful situation on the Creuse, which divides the town into two parts, about 32 m. w.s.w. of Châteauroux. Above B., the river expands so as to form a lake, but at the town it contracts, and breaks into cascades with sufficient fall to turn the machinery of several manufactories. B. is a thriving place, with cloth and linen yarn mills, potteries, tanneries, vinegar-works, forges, etc. It is very ancient, having been frequented by the Romans. Pop. '76, 4724.

BLANC, LE [from *ante Supplement*], a t. of France, in the department of Indre, on the Creuse, 33 m. w.s.w. from Châteauroux. It is beautifully situated, and is a neat and well-built town. It was formerly strongly fortified, but the fortifications are dismantled. Its principal industries are the manufacture of coarse woolen cloths, and tanning. Vinegar is also made here; and there is a considerable trade in the wine of the district, and in iron, fish, wood, and pottery. There are several iron-works in the vicinity. Pop. '76, 4724.

BLANC, MONT. See MONT BLANC.

BLANC, AUGUSTE ALEXANDRE PHILIPPE CHARLES, an engraver, b. France, 1815; head of the department of fine arts in the ministry of the interior, 1848–52. In 1845, he began, but has not finished, a *History of French Painters of the Nineteenth Century*. He has written biographies of Dutch and French painters for the *History of Painters of All Schools*. He is also author of *The Complete Works of Rembrandt, Grammar of the Arts of Design*, and other works, and is editor of the *Gazette des Beaux Arts*.

BLANC, JEAN JOSEPH LOUIS, a celebrated French socialist and historian, was b. at Madrid, 28th Oct., 1813. In 1820, he was placed in the college at Rhodez; in 1830, he went to Paris, and became a clerk in an attorney's office for a short time; but in 1832 he was intrusted with the education of the son of M. Hallette, mechanist of Arras. Here he resided for two years, contributing largely, on literary and political subjects, to the *Progrès du Pas-de-Calais*. He afterwards went to Paris, where he contributed to various political papers, and where in 1838 he founded the *Revue du Progrès Politique, Social et Littéraire*, in which he laid down in a more quiet and leisurely way his socialistic theory. In this he brought out his chief work on socialism, the *Organisation du Travail*, which, in 1840, appeared in a separate form. The book obtained for its author a wide, enthusiastic popularity among the French *ouvriers*, who were captivated by the brilliancy of the writing, the symmetrical simplicity of the scheme, and the freshness of the views advocated. The book denounces the doctrine of individualism—i.e., individual and competitive efforts in labor—and advocates the absorption of the individual in a vast "solidarity," where "each would receive according to his needs, and contribute according to his abilities." B. next published (in 1841–44) a historical work, entitled *Révolution Française: Histoire de Dix Ans*, 1830–40, which produced a deadly effect on the Orleans dynasty. Louis Philippe afterwards declared that "it acted like a battering-ram against the bulwarks of loyalty in France." It owed its success partly to the exposure it gave of the scandalous jobbery and immorality of the crown and its advisers, partly to that passionate ardor which changed the tranquillity of history into the vehemence of a pamphlet, and partly to its academic pomp of style. This was followed by the first volume of a *Histoire de la Révolution Française*, in which the author's aim was not only to describe, from his own point of view, the incidents of the first revolution, but the social history of the 18th century. On the breaking out of the Feb. revolution of 1848,

B. seemed likely to play an important part. His connection with the party of the *Réforme* journal, and his popularity with the working classes, led to his being appointed a member of the provisional government. He was placed by government at the head of the great commission for discussing the problem of labor. At the same time, Marie, minister of public works, began—but without B.'s co-operation—to establish the so-called national workshops, which were to bring about the realization of the socialistic principle, but which only proved the hazardous and impracticable character of B.'s doctrines. The national workshops led to the arrest of the 15th May, 1848, when B. nominally, if not actually, again played a prominent part. A proposal was made to prosecute him, but it was negatived by the national assembly. After the June insurrection, he was again accused, and prosecuted for conspiracy, but contrived to escape to London, where he spent many years. During his exile, he devoted himself to political and historical literature. In 1849 appeared his *Appel aux Honnêtes Gens*, and *Catéchisme des Socialistes;* in 1850, *Pages d'Histoire de la Révolution de Février;* and in 1851, *Plus de Girondins; la République Une et Indivisible.* The work which has secured him the most enduring reputation is his *History of the French Revolution*, written during his residence in England. It is characterized by extensive and original research, which has frequently enabled the author to reverse the common verdicts on historical personages, and to explode many of the extravagant stories of the stormy period of which it treats. In style, it is eloquent, bold, and dignified; and if its sentiments do not always commend themselves to the sober judgment of English readers, there can be but one opinion in regard to its candor, impartiality, and power. It consists of 12 volumes. On the fall of the empire in 1870, B. returned to France, and in 1871 he was returned to the national assembly. B. has a great command of the English language.

BLANCH, or BLENCH HOLDING is one of the ancient feudal tenures in the law of Scotland relating to land, the duty payable to the superior or lord being in general a trifling sum, as a penny Scots, or merely illusory, as a peppercorn, "if asked only," although it may happen that the duty is of greater value. Anciently, many estates in Scotland were held, both of the crown and other superiors, by this tenure, but it is now seldom adopted in the constitution of an original right of property. See CHARTER, TENURE.

BLANCHARD, FRANÇOIS, 1738–1809; a French aeronaut who made many attempts to build a flying-machine. In 1784, he tried a balloon with wings or sails, and a rudder. The next year he crossed the English channel by balloon, and the same year invented the parachute. He came to the United States in 1796, and gave many balloon exhibitions. Two years later, at Rouen, he took up 16 persons with a single balloon, and landed them safely 15 m. away. At the Hague, making his 66th ascent, he was struck with apoplexy, from which he never recovered. His widow made an ascent at Paris in 1819, when her balloon took fire.

BLANCHARD, EDWARD LEMAN, b. England, 1820; about 1845 he was editor of *Chambers's London Journal*, and compiler of various guides and hand-books. He wrote a number of stories, essays, farces, burlesques, and dramas; edited Willoughby's *Shakespeare*, wrote the *Man Without a Destiny*, etc., and for nearly 30 years has furnished the Christmas plays for Drury lane theater. He has been more than 15 years one of the editors of the *Daily Telegraph*.

BLANCHARD, THOMAS, 1788–1864; b. Mass.; mechanic and inventor. Among his inventions were a machine for making tacks, one for turning gun-barrels, a lathe for turning gun-stocks and other irregular shapes; a steam wagon, before locomotives were used; contrivances to aid steamboats in ascending rapids, and a machine for bending large timber. He received in all more than 25 patents for important inventions.

BLANCHE-LYON, the title of one of the English pursuivants-at-arms. See PURSUIVANT.

BLANCHE OF CASTILE, 1187–1252; daughter of Alphonso IX. and Eleanora of England (daughter of Henry II.); married, according to treaty, to Louis, heir-apparent to the crown of France. After the death of Richard the lion-hearted, the nobles opposed to John offered the English crown to Louis, and his wife urged its acceptance; but the death of John ended the conspiracy. Blanche was the main reliance of Louis when he became king, and after his death she was regent during the minority of her son, Louis IX., during which time she defeated a powerful conspiracy to put a son of Philip Augustus on the throne. She acquired Toulouse by treaty, compelled the submission of the duke of Brittany, and aided the count of Champagne in securing the kingdom of Navarre. She had remarkable executive talent, and personally supervised all government departments, not excepting the army. When her son was 19 years or age, she married him to Marguerite of Provence, who was only 12; and when she yielded up her powers in 1236, France was in a most flourishing condition. She again ruled as regent while Louis was gone, against her strong protest, to the crusade. Louis required great sums of money, and when finally he was a prisoner in Egypt further large sums were demanded for his release. The common people of France rebelled against the necessary taxation, but she put them down with a strong hand; and in spite of all these embarrassments she firmly resisted the encroachments attempted by the church. France

has seldom had so able and excellent a ruler, or lost one whose death was more universally lamented.

BLANCHING is a process resorted to by gardeners, to prevent certain secretions which in ordinary circumstances take place in the leaves of plants, and to render them more pleasant and wholesome for food. The action of light is indispensable to the decomposition of carbonic acid by the leaves of plants, and, consequently, to the elaboration of many of the substances from which they derive their peculiar qualities; the exclusion of light, therefore, renders them white, or nearly so, and deprives them of much of their natural coarseness and bitterness—as in the familiar examples of lettuce, celery, sea-kale, etc. B. is accomplished in various ways, as by drawing up earth to the plants, when the lower part of the leaf or leaf-stalk alone is to be blanched; tying the whole leaves together, by which the inner ones are blanched in a somewhat imperfect way, as is commonly done with lettuce; covering with boxes, pots, or the like, as the practice is with sea-kale; causing the leaves to grow up through litter, etc. The figure represents a very convenient B.-pot, of French invention; it is made of earthenware, and perforated with many holes. B., although so simple and easy, is of great importance in the art of gardening, and the usefulness of many plants very much depends upon it. In cabbage, and some other cultivated plants whose leaves form themselves into compact heads, there is a natural B. or etiolation.

BLANC-MANGE', so called from its white appearance, is a jelly made of isinglass and milk. The following is the ordinary recipe for making it. Take a quart of sweet milk or cream, and put in it two ounces of the best isinglass, with the rind of a lemon, a blade of mace, and white sugar to taste. Put the whole in a saucepan, and let it boil a quarter of an hour; then mix with 6 bitter almonds and 24 sweet ones, beaten into a paste with a little water; strain through a piece of muslin; and having let the composition settle a little, pour into a mold, and turn it out when cold. Soyer gives one ounce of isinglass to a quart of milk, a quarter of a pound of sugar, a quarter of an ounce of cinnamon, a little grated nutmeg, half of the peel of a lemon, and a bay-leaf, prepared as above. B. is also made of calf's-foot jelly and eggs, of arrow-root and milk, etc.; and the flavor is modified to taste.

BLANCO, a co. in central Texas; on Perdinalis river; 727 sq.m.; pop. '70, 1187—44 colored; in '80, 3550; an agricultural region, chiefly prairie. Co. seat, Blanco.

BLANCO, CAPE, a remarkable headland on the w. coast of Africa, in lat. 20° 47′ n., and long. 16° 58′ w., the extremity of a rocky ridge (called Jebel-El-Bied, or White mountain) which projects from the Sahara in a westerly direction, and then bending southward, forms a commodious harbor called the Great bay. The bay and town of Arguin, which is supposed to have been the limit of ancient navigation in this direction, lies some miles to the southward. Southward to the mouth of the Rio Grande the shores are of a low sandy character, with a current tending s.w., and prevalent n.e. trade-wind; northward from cape B. to cape Geer, the coast is rocky, with a moderate elevation. On account of the deficiency of good harbors, the prevalence of w. winds, and other causes, the casualties to shipping are very numerous. The constancy of w. wind on a coast almost wholly within the sphere of the trade-winds, is very remarkable, and is accounted for by the rarefaction of the air by the heat of the sands of the Sahara. The natives of the Canary islands carry on a pretty lucrative fishery in the bay in boats of from 100 to 150 tons burden. Cape B., which is composed of mixed calcareous and silicious sandstone, was first discovered by the Portuguese in 1441.—Cape B. is also the name of several less important headlands in Spain, Greece, America, and the Philippines.

BLAND, a co. in s.w. Virginia; 330 sq.m.; pop. '70, 4000—217 colored. Productions agricultural; co. seat, Mechanicsburg.

BLAND, a beverage which is—or formerly was—a common drink among the inhabitants of the Shetland islands during the summer months. It is prepared from the whey or serum of churned milk, and is said to be an agreeable beverage. Dr. Edmondston, in his *View of the Zetland Islands*, describes B. as being, when twelve months old, perfectly good and transparent; its flavor then bearing a strong resemblance to lemon-juice.

BLAND, THEODORIC, 1742–90; an American patriot, descendant of Pocahontas; educated in medicine in Edinburgh; practiced in Virginia, and espoused the cause of the colonies. He was lieut.col. of Virginia cavalry, and served through the war, being an intimate friend and confidant of Washington. He was a member of congress under the federal constitution. He left the "Bland Papers," in which are many valuable facts concerning the struggle for liberty.

BLANDFORD, a t. in Hampden co., Mass.; pop. '80, 979. It has manufactories and a good public library; its picturesque scenery and elevated situation, about 2000 ft. above the sea, make it a favorite summer resort.

BLAND'FORD-FO'RUM, or MARKET BLANDFORD, a t. in Dorsetshire, on the right bank of the Stour, 16 m. n.e. of Dorchester. It lies in a fine tract of pasture-land, famed for its multitude of cows. It suffered much in 1579, 1677, 1713, and 1731, from

fire. It is built of brick, and is neat and regular. It was formerly famed for its manufactures of bandstrings and lace, the point-lace bringing £30 a yard. Shirt-buttons are made here. Pop. in 1871, 4011.

BLANDRATA, GIORGIO, the founder of Unitarianism in Poland and Transylvania, was a native of Saluzzo, in Italy. He had established himself as a physician at Pavia, when he was compelled, on account of his heretical opinions, to fly to Geneva in 1556, where at first, and to avoid further molestation, he feigned to agree with Calvin. In 1558, he went to Poland, hoping to find there greater freedom of thought and speech; and in 1563 he betook himself to the court of John Sigismund, prince of Transylvania, whose favorite physician he became. Here he exerted himself prudently but assiduously to spread his doctrines, and succeeded in forming a considerable party. In his old age, however, the heat of his proselytizing zeal died out; and it is asserted that, to preserve his worldly interests, he even forsook the cause of the Unitarians, and favored that of the Jesuits, who were in high esteem with the prince. He was murdered in 1590 by his nephew, whom he had threatened to disinherit on account of his attachment to the Catholic church. B.'s religious treatises are entirely destitute of importance.

BLANE, Sir GILBERT, a distinguished physician, was b. at Blanefield, Ayrshire, Aug. 29, 1749. He studied at Edinburgh university, and afterwards became private physician to lord Rodney, whom in that capacity he accompanied in 1780, when Rodney assumed the command of the West Indian squadron. On one occasion, when all the officers were wounded, B.'s bravery was so conspicuous, that lord Rodney immediately obtained for him the appointment of physician to the fleet. In 1785, he was elected physician to St. Thomas's hospital, London, having previously been appointed physician-extraordinary to the prince of Wales. In 1795, he was chosen head of the navy medical board, and was greatly instrumental in introducing the use of lemon-juice, so effective in preventing scurvy, into every vessel in the navy; and in many other ways he was active in promoting measures for the prevention or remedy of diseases on board ship. In 1809, he was employed to report on the cause of the unhealthiness of the Walcheren army, and the following year he was sent to inquire into the expediency of establishing a naval arsenal and dockyard at Northfleet. In 1812, he had a baronetcy conferred upon him, and in the same year the prince regent made him his physician in ordinary. When the duke of Clarence ascended the throne as William IV. in 1830, he made B., then 81 years old, his first physician. B. died June 26th, 1834. He published several valuable works, characterized by varied knowledge and originality of thought, the most popular and useful of which are, *Observations on the Diseases of Seamen*, a lecture on *Muscular Motion*, and *Elements of Medical Logic*.

BLANÉS, a t. of Spain, in the province of Gerona, and 22 m. s. of the city of that name, with a port on the Mediterranean. Pop. 5000.

BLANK BONDS were Scotch securities, in which the creditor's name was left blank, and which passed by mere delivery, the bearer or holder being at liberty to insert his name in the blank space, and sue for payment. The intention originally was to save the expense of conveyances, and to facilitate the transmission of the obligation; but experience having proved that they were capable of being used for fraudulent purposes, these bonds were, by a Scottish act, passed in 1696, declared void. The act, however, excepts from its provisions the notes of trading companies, and indorsements of bills of exchange. See BOND, SECURITY.

BLANK CARTRIDGES. The distinction between *blank* and *ball* cartridges will be found noticed under CARTRIDGE.

BLANKENBURG, a t. in the duchy of Brunswick, 37 m. s.s.e. of the capital, is situated on the borders of the Harz mountains, at an elevation of 732 ft. above the sea. It has a gymnasium, and several charitable and educational institutions. Pop. '75, 4519, chiefly engaged in mining; iron, marble, and dye-earths being plentiful in the surrounding districts. On the Blankenstein, a rocky height immediately adjoining the town, there is a palace belonging to the duke of Brunswick; and on the lofty summit of the Regenstein, about half a mile distant, there are the remains of a large castle, with many chambers, hewn out of the rock by Henry the fowler in 919. Louis XVIII. resided at B. as comte de Lille, 1796–98.

BLANK VERSE is verse without rhyme (q.v.), and depending upon meter (q.v.) alone. The classical productions of the Greek and Roman poets—at least such of them as have come down to us—are composed on this principle; and, accordingly, when the passion for imitating classical models set in, rhyme came to be looked upon as an invention of Gothic barbarism, and attempts were made in most countries to shake it off. The first specimen of blank verse in English is a translation of the second and fourth books of Virgil's *Æneid*, by the earl of Surrey, who was executed in 1547; but it had been used by Italian and Spanish writers as early as about the beginning of that century. In England, its adaptation to the drama was at once felt, and in that department of poetry it soon became and has continued dominant—if we except the effort made by Dryden and others, after the restoration, to return to rhymed plays; but in other kinds of poetry, it was not till the appearance of *Paradise Lost* (1667) that it could be said to have taken root; and even then the want of rhymes was felt.

as the poet expected it would. Many poets have since followed Milton's example; and English narrative, didactic, and descriptive poetry is partly in B. V., partly in rhymed couplets. It is chiefly in "heroic" meter, as it is called—that is, in verses or lines of ten syllables—that blank verse has found a firm footing. Some, in fact, would restrict the name B. V. to lines of ten syllables, not considering it applicable to such meters as those of Southey's *Thalaba* and Longfellow's *Hiawatha*.—Dramatic B. V. is characterized by the frequent occurrence of a supernumerary syllable at the end of the line:

To be | or not | to be, | that is | the ques|*tion:*
Whether | 'tis no|bler in | the mind | to suf|*fer.*

In Italian and Spanish, B. V. never became popular, and still less in French. The German language seems to admit every variety of blank meter.

BLANQUI, JÉRÔME ADOLPHE, one of the first French economists, was b. at Nice, 28th Nov., 1798, and educated at the lyceum of that city. In 1814, his family quitted Nice, and young B. went to complete his studies at Paris, where he became acquainted with J. B. Say, who induced him to turn his attention to the study of political economy. In 1825, by Say's recommendation, he was appointed professor of history and of industrial economy in the commercial school at Paris. On the death of Say, he was appointed professor of industrial economy in the conservatoire des arts et métiers, and was one of the editors of the *Dictionnaire de l'Industrie Manufacturière, Commerciale, et Agricole.* In June, 1838, he became a member of the academy of moral and political science. The academy sent him to Corsica, to study the condition of that country, and in 1839, to Algiers for the same purpose. In 1841, he visited Turkey. In 1851, the academy, which highly valued his abilities, requested him to furnish a complete account of London in its financial and other aspects. This task he executed to the satisfaction of the *savans* who employed him. He died at Paris on the 28th Jan., 1854. B. as a national economist, was somewhat inclined to socialism. Like his master, Say, he was in favor of free-trade. In method, he is ingenious; in style, transparent; and even the dryest discussions become interesting, from his lively mode of treating them. His principal works are—*Voyage d'un Jeune Français en Angleterre et en Ecosse* (Paris, 1824); *Résumé de l'Histoire du Commerce et de l'Industrie* (Paris, 1826); *Précis Elémentaire d'Economie Politique, précédé d'une Introduction Historique, et suivi d'une Biographie des Economistes,* etc. (Paris, 1826); and, most important of all, the *Histoire de l'Economie Politique en Europe, depuis les Anciens jusqu'à nos jours, suivie d'une Bibliographie raisonnée des Principaux Ouvrages d'Economie Politique.*

BLANQUI, LOUIS AUGUSTE, the brother of the economist, was b. at Nice in 1805. He has made himself conspicuous chiefly by his rabid advocacy of the most extreme political opinions. From an early age, he dabbled in conspiracy, and submitted to its penalties with the pride of a martyr. After the revolution of Feb., he formed the central republican society, which menaced the very existence of the provisional government. He it was also who organized the revolutionary *attentat* of the 15th May, the aim of which was to overthrow the constituent assembly. At the head of an excited mass, he made his appearance before the national representatives, and with that melodramatic love of liberty which makes a French patriot fancy it to be his first and most sacred function to emancipate the world, demanded the *resuscitation of the Polish nationality!* His coadjutor, M. Huber, went a step further, and pronounced the dissolution of the assembly. The latter fortunately proved itself strong enough to crush this insolence. B. was arrested, and condemned to 10 years' imprisonment in Belleisle. In 1861, he was sentenced to other 4 years' imprisonment. He appeared again as one of the most active spirits in the red republican movement of 1870–71, and once more became a prisoner of state.

BLAPS, a genus of insects, of the order *coleoptera*, the type of a tribe called *blapsides*, the species of which are numerous, all of a dark color, destitute of wings, and having the elytra or wing-cases united together. They run slowly, however, in comparison with many kinds of beetles, and inhabit dark and damp situations, feeding chiefly on dead vegetable matter. They have the power of secreting and emitting a brownish, acrid, irritating fluid, of a peculiar and penetrating odor, with which they appear to be furnished for the purpose of self-defense, and which some of them are capable of throwing to a distance of 6 or 8 inches. *Blaps mortisaga* is a common British species, of about 1 in. long, and of a shining black color. It is sometimes called DARKLING BEETLE, and CHURCHYARD BEETLE, sometimes seems to share with the cockroach (q.v.) the appellation of BLACK BEETLE. It is a frequent companion of the cockroach in pantries and cellars.—*Blaps sulcata* is cooked with butter, and eaten by Turkish women in Egypt, under the notion that it will make them fat, this being, in their estimation, one of the chief points of beauty.

BLARNEY, a village in Ireland, 4 m. from Cork, having a castle built in 1449 by Cormac McCarty. Near the castle are the "groves of Blarney," and on the summit of the castle tower is the stone, the kissing of which is said to endow one with the gift of coaxing, wheedling, and flattering. The true stone is said to be one in a wall where it can be kissed only by a person held over the parapet. The name has given a noun, a verb, and a participle to the English language.

BLASIUS, a saint and martyr, was bishop of Sebaste, in Cappadocia, when Licinius began a bloody persecution of the Christians. B. left the town, and concealed himself in an unknown chasm in the rocks, but his abode was discovered by Agricola, while out hunting. The saint was conveyed to Sebaste, and as he steadfastly refused to deny Christ, and worship the heathen gods, he was put to death (316 A.D.) with circumstances of the most horrid cruelty. At one period, his worship must have been widely diffused, judging from the extent of territory over which his relics were scattered. The woolcombers claim him as their patron, for the singular reason that he was tortured, among other instruments, with a wool-comb. At Bradford, in Yorkshire, there is a septennial procession of that craft on his day. The practice of invoking St. B. in cases of sore throats, is said to have originated in the circumstance that, when young, he saved the only son of a rich widow from being choked by a fish-bone. It has been conjectured, however, that the wool-comb has probably been mistaken for a fish-bone, and that the story of the rich widow's only son is simply a myth elaborated in explanation of the circumstance. St. B.'s day is the 3d February.

BLASPHEMY is an offense against God and religion, by denying to the Almighty his being and providence; or by contumelious reproaches of our Lord and Savior Jesus Christ; also all profane scoffing at the Holy Scriptures, or exposing them to ridicule and contempt. Seditious words, moreover, in derogation of the established religion may be proved under a charge of blasphemy. These all are offenses punishable at common law by fine and imprisonment, or other infamous corporal punishment; for Christianity is held to be part of the laws of England; and a blasphemous libel may be prosecuted as an offense at common law, and punished with fine and imprisonment. In Gathercole's case, tried at York, in 1838, where the defendant, a clergyman of the church of England, was prosecuted for a libel on a Roman Catholic nunnery, and in which he also made a violent attack on the tenets and the morality of the Roman Catholic church, it was laid down by the judge who tried the case (the late baron Alderson), that a person may, without being liable to prosecution for it, attack Judaism, or Mahommedanism, or even any sect of the Christian religion, save the established religion of the country; and the only reason why the latter is in a different situation from the others is because it is *the form established by law*, and is therefore a part of the constitution of the country. But any general attack on *Christianity* is also the subject of criminal prosecution, because Christianity is the public religion of the country. Thus, as an offense against religion, B. may assume one of two forms: first, either as against the articles and creeds of the established church; or secondly, as against a dissenting community, in the libel against whom, a general attack on the Christian religion is involved. The B. must in some manner have been overtly and publicly declared, either by a speech on some public occasion, or by the act of publication in print.

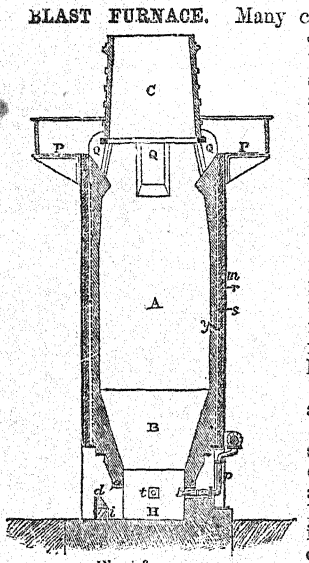
The Scotch law regarding this offense is now very much the same. The old severe Scotch acts, one passed in 1661, and another in 1695, which provided capital punishment for offenses of this description, were repealed by the 53 Geo. III. c. 160. The punishment is now arbitrary at common law; and by the 6 Geo. IV. c. 47, the punishment of B. is further restricted, and made the same as in England. It is also enacted by the second section of that act, that a person convicted of a second offense may be adjudged, at the discretion of the court, either to suffer the punishment of fine or imprisonment, or both, or to be *banished* the country; but the provision as to the punishment of banishment is repealed by the 7 Will. IV. c. 5. The latest and most remarkable illustration of the Scotch law regarding this offense, is a case that was tried before the high court of justiciary in 1843. The prisoner, who defended himself, was accused, convicted, and sentenced to imprisonment for fifteen months, for publishing profane, impious, and blasphemous books, containing a denial of the truth and authority of the Holy Scriptures and of the Christian religion, and devised, contrived, and intended to ridicule and bring into contempt the same. In the course of the trial, the prisoner endeavored to justify his conduct by quotations from the Bible, which, he maintained, warranted the language of the blasphemous works in question. But the court would not allow such a line of defense, and the lord justice-clerk (the late right honorable John Hope), in charging the jury, pointed out that the indictment charged that the wicked and felonious publication of such works *is* a crime, and that therefore the jury were not to consider themselves engaged in any theological discussion, but simply in trying whether a known and recognized offense against the law had been committed. His lordship proceeded further to expound the law as follows: "Now, the law of Scotland, apart from all questions of church establishment or church government, has declared that the Holy Scriptures are of supreme authority. It gives every man the right of regulating his faith or not by the standard of the Holy Scriptures, and gives full scope to private judgment, regarding the doctrines contained therein; but it expressly provides that all 'blasphemies shall be suppressed,' and that they who publish opinions 'contrary to the known principles of Christianity,' may be lawfully called to account, and proceeded against by the civil magistrate. This law does not impose upon individuals any obligations as to their belief. It leaves free and independent the right of private belief, but it carefully protects that which was established as part of the law, from being brought into contempt." The learned judge also observed: "I think it also my duty to add—as a part of the [prison-

er's] address was directed against the policy and expediency of this prosecution—that I think it was a most proper and fit prosecution. I have no doubt of the effect that will result from this prosecution; because, though, in his advertisement and address, this individual declares that he addresses himself chiefly to the working-classes of Scotland, yet I am sure that he deceives himself if he imagines that that is a class which would easily part with their belief in those truths, which are perhaps more valuable to them in this life than to any other class in the community. There may, indeed, be a class of persons, like the prisoner at the bar, in situations above that of the working-classes, young men whose education is imperfect, and their reading misdirected; and it is to save them from the mischief of these opinions that it is necessary the law should take its course. See RELIGION, OFFENSES AGAINST.

BLASPHEMY (see *ante*). In the United States, besides the common law, there are many statutes defining B.; but they all hold it to consist in words regarding the Deity only. It is defined as purposely using words concerning God calculated and designed to impair and destroy the reverence, respect, and confidence due him, as the creator, governor, and judge of the world; it is a willful and malicious attempt to lessen reverence for God by denying his existence or attributes, and to prevent men from having confidence in him. Blasphemy is a misdemeanor at common law, for which special punishments are assigned in various statutes; but a temperate discussion in which the existence of God is denied is not an offense. Gross profanity is blasphemy in a lesser degree, and it is punishable in most of the states, but the law is seldom enforced.

BLASTE'MA, the embryo of a seed, or the radicle and the plumule with the parts which connect them. Biologists apply the term to the rudimental mass from which tissue is formed.

BLAST FURNACE. Many costly experiments have been tried of late years in order to determine, along with other related questions, the best form of the blast furnace in which iron is smelted. Which is the most serviceable form is as yet a very much disputed point; but, according to the published accounts, furnaces of the unusual height of 80 to 100 ft. give, as a rule, the best results. There are two types of blast furnaces, irrespective of differences in their forms, as regards the way in which they are constructed. Some are built with thick walls, either entirely of brick or of brick and stone, hooped with iron, forming massive towers. Others, again, are formed of comparatively thin brick walls, and depend for their strength on an outer malleable iron casing, in which case they are called *cupola* furnaces. The furnace A., in fig. 1, article IRON, is an example of the former, and the annexed figure represents one of the latter kind.



Blast furnace

The various parts of the furnace are distinguished as follow: A. is the *shaft* or *body*, generally either in the form of a cone or cylinder, or somewhat barrel-shaped, in which case, the portion marked B is not distinguisl able from the shaft. B. is called the *boshes*, and is the part of the furnace which, from the high heat to which it is exposed, usually gives way first. H is the *hearth*, and C is the *tunnel-head*, which, however, is usually wanting when the mouth is closed by a bell and cone to save the gases generated in the furnace. P is the charging platform, and Q, Q, the openings through which the ore, fuel, etc., are fed. These materials are brought to the platform by hoists, inclines, or level gangways, according to the situation of the furnace. Just below the boshes there are four or five openings in the circumference of the *tuyeres t*, and another for the arrangements required for tapping the furnace. As respects the latter, *a* is called the tymp-arch, immediately below which is placed the *tymp* its lf, consisting of a rectangular iron box containing water in a coiled pipe. The hearth is prolonged in the direction of the *damp-plate d*, and the space between it and the tymp is filled up with sand or clay, in which there is a channel for the escape of slag. In the damp-plate is placed the *tapping-hole, i*, through which the molten iron is run off. The pipe at *p* conveys the blast, produced by a powerful blowing-engine, and heated to between 600° and 1400° F. In 1875, there were in Great Britain 993 blast-furnaces. See IRON.

BLASTING. Before gunpowder was invented, the separation of masses of stone from their native rock could only be effected by means of the hammer and wedge, or by the still slower method of fire and water. In soft and stratified rock, wedges are still used for quarrying stones for building purposes, but in hard rock, or where regularity of fracture is no object, gunpowder is universally employed. There are two kinds of B—first, the small-shot system; and second, that of large blasts or "mines."

The small-shot system consists of boring holes into the rock, of from 1 to 6 in. in diameter, and of various depths, according to circumstances. In hard rock, this is done by a steel pointed drill, struck by a hammer, and turned partly round after each blow, to make the hole cylindrical. The addition of a little water serves to preserve the temper of the boring tool, and makes the rock more easy to cut. In soft rock, when ever the hole is to be vertical, a "jumper" is used; this is a weighted drill, which acts merely by its own weight, when let fall from about a foot in height. The powdered stone is removed at intervals by a "scraper." The rate of progress varies, of course, with the hardness of the rock. At Holyhead, the average work done by three men in hard quartz rock, with 1¼ in. drills, is 14 in. in depth per hour; one man holding the drill, and two striking. After the hole is bored, it is cleaned out, and the powder poured down. A wad of dry turf or hay is put over the charge, and the rest of the hole "tamped," or filled with broken stone, clay, or sand. The shot is fired by a length of Bickford's patent fuse. When it is desirable to prevent the stones from flying about, when the shot is fired, a shield of boiler-plate, or of brushwood weighted, may be laid over the hole.

Small shots may be fired, even under water, by inclosing the charge in a tin case, with a tube of powder reaching to the surface; or in a canvas bag, well tarred, tied at the neck round a length of Bickford's fuse, which burns under water. The charge is inserted in the drill-hole; and the weight of the superincumbent water acts as tamping.

In removing the wall between the old and new Shadwell basins of the London docks, shots were fired under water within a few yards of vessels lying in the basin, by using moderate charges, and by keeping a raft of timber floating over the hole, as a shield to prevent anything flying upwards.

The voltaic battery has been used for firing shots, chiefly under water, since 1839, in which year it was employed at the wreck of the Royal George and at the Skerryvore light-house.

When a large mass of rock has to be removed at once, or where a steady supply has to be daily furnished of irregularly broken stone, for breakwater or other purposes, recourse must be had to large blasts, or "mines." The greatest isolated example of this kind of blasting was the overthrow, in 1843, of the Rounddown cliff at Dover, by 18,500 lbs. of powder, in three separate charges, fired simultaneously by voltaic electricity. But by far the grandest system of B. by mines is to be seen at the quarries for supplying stone to the breakwater at Holyhead, where small shots having been found inadequate, large mines were introduced in 1850. These large blasts are of two kinds—"shafts" sunk from the top of the rock; and "headings," or galleries driven in from the face.

The shaft-holes are 6 ft. long by 4 ft. wide, of various depths, according to the height of the rock, but seldom much exceeding 60 ft. The deal-box, with the charge of powder, is placed in a chamber cut at one side of the shaft, so that the tamping may not be in the direct upward line of fire. The tamping consists of the stone and débris which have come out of the shaft; and the wires from the battery are protected from injury by being laid in a groove cut in a batten placed up one angle of the shaft.

It is evident that the same point in the rock may be reached as well by a heading or gallery driven in from the face of the rock, as by a shaft from the top, and often by a shorter route. Headings are made 5 ft. high by 3 ft. 6 in. wide, and are driven, if possible, along a natural joint in the rock. The direction of the gallery is changed and sunk at parts, to prevent the tamping from being blown out. Four men can, on the average, drive 5 ft. run of heading per week; but cannot sink above 3 or 4 ft. of shaft, which has a greater sectional area, and is more inconvenient to work in.

The charge of powder may be divided and placed in two or more separate chambers, and it is better thus to spread a heavy charge over a length of face, than to have it in one spot, at a greater distance from the face than about 30 feet.

The charges for these mines vary from 600 lbs. to 13,000, and even more, pounds of powder; and the produce is from 2 to 6 tons of stone to the pound of powder, according to the density of the rock and the position of the mine.

Besides the quarrying of stone, B. is used for military objects, or where total destruction is aimed at, and an excess of powder is little or no objection.

Of late years great improvements have been effected in the production and application of explosive agents other than gunpowder, which latter, until lately, may be said to have been exclusively used for the purpose of blasting. Nitro-glycerine (q.v.) and gun cotton (q.v.) were discovered within two years of each other; but while gun cotton was immediately applied to industrial purposes, nitro-glycerine was destined to remain a chemical curiosity for about 16 years.

Dynamite is a preparation of nitro-glycerine and porous earth, in the form of a pasty mass, which, without materially impairing its explosive properties, has the effect of rendering it perfectly safe to handle.

One of the most celebrated applications of boring and blasting to modern engineering was the driving of the Mont Cenis tunnel. See TUNNEL.

BLASTING (*ante*). The processes of blasting are essentially the same here as in Europe; but the developments of mining, railroad building, and improvements in navigation, have rendered necessary some very extensive operations. The most impor

tant was, perhaps, the removal of the reefs in the East river, at Hallett's point, near New York, known as the "Hellgate improvement." The rock to be removed extended more than 100 yards into the river, greatly narrowing the channel and rendering navigation extremely difficult. The plan of operation was to sink a large square shaft on the Long Island shore from which the rock projected, and to run into the rock at a proper depth long galleries radiating from the place of entrance like the lines of an expanded fan. The entrance shaft was nearly 100 ft. square, and its bottom was 32 ft. below low water. Nearly 20 tunnels were bored in all directions, extending from 200 to 240 ft., and all were connected by lateral galleries. All the excavated rock was hauled to the entrance and hoisted to the surface. The work was completed in Sept., 1876, and made ready for blasting with more than 52,000 pounds of explosive material in many thousands of holes drilled for the purpose. The explosives were dynamite, rendrock, and vulcan powder. The firing was by electricity. On the given day a quarter of a million people found their way to points on land and water where the explosion could be seen. When the eventful moment arrived, gen. Newton, the engineer in charge, took the hand of his little girl, a mere infant, and with it pressed down the key by which the battery was fired. There was a rumbling or shaking of the ground, the rising of a great mass of water from 20 to 40 ft. in the air, a few small stones thrown a little higher, an immense mass of smoke, and all was over. Millions of tons of rock had been shattered, and yet the noise and the shock were less than would have attended the simultaneous discharge of half a dozen field-pieces in the open air. There was so much doubt and ignorance about the possible effect of this explosion that many people living one, two, and three miles away left their houses and took positions in the open air, through fear of wide-spread ruin. The work was completed successfully, and after dredging out the broken stone the navigation of the channel was greatly improved. In previous years much has been done in the harbor of New York by surface-blasting, i.e., lowering to the face or to some crevice of a rock cans filled with nitro-glycerine and exploding it by electricity, the effect being to gradually wear away the rock. The great work of the Sutro tunnel (q.v.) was another triumph for American engineering.

BLATTA. See COCKROACH.

BLAYE (ancient *Blavia*), a fortified seaport of France, in the department of the Gironde, 20 m. n.n.w. of Bordeaux. It is built on the right bank of the river Gironde, which at this point is about 2½ m. in breadth, at the base of a rocky eminence crowned with a strong citadel. The town is further defended by the two forts of Paté and Médoc, which command the passage of the river. The port of B. is a very busy one, all inward vessels being required to anchor and deliver the manifests of their cargoes; and many outward-bound vessels lay in their provisions here. B. has manufactures of linen and woolen, glass and earthenware; a considerable export trade in corn, wine, brandy, oil, fruits, soap, etc., and tribunals of jurisdiction and of commerce. Pop. (1876) exclusive of garrison, 3801.

BLA'ZON, BLA'ZONRY (Ger. *blasen*, to blow, as with a horn). These heraldic terms originated in the custom of blowing a trumpet to announce the arrival of a knight, or his entrance into the lists at a joust or tournament. The blast was answered by the heralds, who described aloud and explained the arms borne by the knight. B. and B. thus came to signify the art of describing, in technical terms, the objects (or charges, as they are called) borne in arms—their positions, gestures, tinctures, etc., and the manner of arranging them on the shield.

Rules of Blazoning.—As heraldry, though an entirely arbitrary, is a very accurate science, the rules of blazoning are observed on all occasions with the most rigid precision. The following are the most important: 1. In blazoning or describing a coat of arms, it is necessary to begin with the field, mentioning the lines by which it is divided —*per pale, per fess*, etc., if such there be—and noticing if they are *indented, engrailed*, or the like, it being taken for granted that they are straight, unless the contrary be mentioned. 2. There must be no unnecessary repetition in blazoning; thus, where the field is blue, and the charges yellow, we should say, *azure, a crescent between three stars, or*, thereby implying that both the crescent and the stars are *or*. 3. For the same reason, where a color has been already mentioned, and it is necessary, in order to avoid ambiguity, to repeat it in describing a subsequent charge, we say, *of the first*, or *of the second*, as the case may be. Thus, we should say, *azure, on a saltire argent, three water bougets of the first*, thus avoiding the repetition of the word azure. 4. Again, recurring to our first example, it would be an error to say, *three stars with a crescent between them*, because we must always begin with the charge which lies nearest the center of the shield. 5. Where the charges are of the natural color of the objects or animals represented, in place of describing the color, you simply say *proper*—i.e., of the proper or natural color. 6. Another general rule in blazoning, or rather in marshaling coat-armor, is, that *metal shall never be placed upon metal, nor color upon color.*

The rules for blazoning separate charges, whether animate or inanimate, are indicated in the descriptions which will be found of them under their respective heads. See ORDINARIES; also BAR, BEND, etc.

BLEACHING (Ang.-Sax. *blæcan*, from *blæc*, pale, bleak) is generally understood to mean the process of whitening or decolorizing cloth; but the term is also applied to the

decolorizing of such substances as the fixed oils, Irish moss, etc. Until about the close of the 18th c., B. depended upon the natural bleaching agencies present in the atmosphere and in the sun's rays. The usual plan was to spread out the cloth on a grass-field, called a bleaching-green, and to continue sprinkling it with water several times a day. After being thus exposed for several months to the action of air, light, and moisture, the cloth was rendered white. The process was necessarily tedious and occupied much valuable land, and for this reason a large quantity of the cloth required to be bleached was sent to Holland for that purpose. A particular kind of linen, which was regularly sent to Holland, received on that account the name of *Hollands;* and another variety of linen, which, from its fineness, was generally spread on the better grass-fields or lawns, received the title of *lawn.* An improvement in the preceding process was to dip the cloth occasionally in a weak *alkaline lye,* or solution of an alkali, such as soda in water, which step was called *bucking;* after which the cloth was spread out on the grass for some weeks, and regularly moistened with water, this stage being styled *crofting;* the cloth was then soaked in sour milk and water, which was called *souring,* and again exposed on grass to the action of air and sunlight. By repeating the bucking, crofting, and souring operations several times, the bleaching was very much hastened, and the amount of land occupied in bleaching-greens lessened. The next improvement was the introduction of dilute sulphuric acid instead of sour milk, as the souring agent; and this was so effectual, that it lessened the time required for B. from about eight months, which was the original time, to about four months.

Till very recently, it was thought that the agent in this natural mode of B. was entirely resident in the sun's rays, but the discovery of the substance called ozone (q.v.), which possesses very powerful B. properties, and which in greater or less quantity exists in the air of country districts at all times, has led to the opinion, now held by chemists, that the B. which takes place when the cloth is moistened and exposed to the air is mainly due to the ozone present therein; though the chemical rays which accompany the luminous rays of the sun may assist in the B., and also aid in the formation of the ozone. That the ozone has very much to do in open-air B., is observable from the fact that in town districts, where little or no ozone exists in the air, cloth is never bleached white.

In the year 1785, Berthollet, a distinguished French chemist, discovered the powerful B. properties of *chlorine* (q.v.), and immediately thereafter it was suggested that chlorine would be useful in the B. of cloth. At the first, the gas chlorine was employed, and being diffused in the atmosphere of a vessel or small apartment, cloth hung therein was speedily bleached. It was found, however, that the chlorine, which bleaches, or destroys color by uniting with the hydrogen of the coloring principle and thus decomposing the color, could also unite with the hydrogen of the fibre (see LIGNIN) and destroy or render tender the textile fabric. So long as chlorine was employed in the gaseous state, it was very difficult to use it of such strength as only to destroy the color, without also rotting the cloth. It was then suggested, that as chlorine was soluble in water, to the extent of two volumes of chlorine gas in one volume of cold water, the solution of chlorine might be employed. But although chlorine water was found to act efficiently and safely when the solution was of the proper strength, it was very difficult always to make it of the same strength, and more so to preserve it when made; as the least exposure to light causes more or less of the chlorine to unite with the hydrogen of the water, forming hydrochloric acid, which does not possess B. properties. After attempts to fix the chlorine in alkaline solutions, it was found that dry slaked lime was an admirable absorber of chlorine gas. The material produced from the union of chlorine with dry slaked lime is known as the *chloride of lime,* or *bleaching powder* (q.v.), and this is the substance which has continued from 1799 up to the present time to be the great artificial bleacher of cotton and linen fabrics. It is not serviceable in the destruction of the color of wool, silk, or the oils and fats; such materials being bleached by the employment of other agents, as will be afterwards noticed.

BLEACHING OF COTTON AND LINEN FABRICS.—The substances requiring to be got rid of in the purification of cotton and linen cloth are (1) the organic coloring matter natural'ly present in the fiber; (2) resinous and fatty bodies, also inherent in the fiber; (3) weavers' dressing and perspiration taken up during the process of spinning; and (4) certain saline or earthy substances. The *first stage* in the B. is the singeing of the cloth, which is accomplished by drawing the cloth rapidly over a red-hot iron cylinder, or a numerous series of gas jets, which burn off the minute particles of fiber, resembling in appearance short hairs or down, and leave the cloth perfectly smooth. The *second stage* is the washing or scouring of the cloth, which consists in rolling up the pieces of calico or linen into bundles like coils of rope, and throwing a number of pieces into a large vat among lukewarm water, and allowing them to lie till fermentation begins, and proceeds some length, when the cloth is taken out, and thoroughly washed in the dash-wheels; which are large horizontal cylinders divided into several compartments, into each of which a stream of water keeps running while the wheel is turning. The *third stage* is boiling with lime-water, or *bucking.* The apparatus employed is called the *bowking* or *bucking kier,* and consists of two compartments. The lower part is a boiler containing the lime-water, and the upper part is a capacious circular tank, into which the cloth in bundles, as it comes from the dash-wheels, is placed. By an ingenious arrangement, the

lime-water is alternately forced up, by the compression of the steam, through a pipe into the upper compartment, and falls in a shower upon the cloth, through which it percolates and sinks again through perforations into the boiler, to be again propelled into the upper compartment. Instead of using lime alone, a mixture of lime and carbonate of soda ($NaOCO_2$) is occasionally employed, which acts by forming the inert carbonate of lime or chalk ($CaOCO_2$) and caustic soda (NaO), which possesses high detergent properties. The chemical action which the boiling lye exerts on the cloth is in the formation of a soap with the resinous and fatty substances naturally inherent in the cotton or linen fiber, or communicated to it in the process of weaving, the greater portion of which is detached by the lye in the *bucking kier* and ultimately removed by a subsequent washing with water. This takes place either in the dash-wheels, or in a more effectual washing arrangement, consisting of a series of boxes or vats of different depths, placed side by side, into which the cloth is made to dip successively by passing over and under two sets of rollers. As the cloth moves on from the lower vats to the higher, it is passing from the soiled water to the more pure, as a stream of pure water is kept constantly running through the vats from the higher to the lower. The *fourth stage* in B. is the *souring* or *chemicking* in dilute sulphuric acid, of the strength of one gallon of the acid to from 25 to 30 gallons of water. The weak acid liquid is put into a large stone vat, and the goods are steeped in it. The acid acts beneficially in removing the remaining traces of the lime-soap which have adhered to the cloth, and a second washing in water, followed by bucking or scouring in soda lye, and a third washing in water are generally found necessary to obtain the cloth in the condition best suited for the subsequent operations. The *fifth stage* is *chemicking with B. liquor*, obtained by dissolving *B. powder* (q.v.) in water, and allowing the impurities or insoluble matter to subside. The B. liquor is much diluted with water, and the cloth is steeped in it for about six hours, then taken out, and allowed to soak for other six hours in a second vat containing water, after which it is drawn out and exposed to the atmosphere, when the carbonic acid of the air sets free a portion of the chlorine from the B. powder, imbibed by the cloth. The *sixth stage* is another *souring* process, during which the cloth is immersed for about four hours in a steeping vat, containing dilute sulphuric acid of the strength ranging from 1 to 8 gallons of acid in 200 gallons of water. This acid liquid, as it soaks the cloth, encounters the B. liquid which previously saturated the fiber of the cloth, and the acid combining with the lime of the B. liquid, liberates the chlorine, which attacks the remaining traces of color and removes them from the cloth.

The cloth, on being removed from the souring-vat, is boiled with soda lye, washed, and again treated with dilute sulphuric acid, which more effectually removes the decomposed coloring matter. It is thereafter thoroughly washed, passed through rollers to remove some of the water; then introduced into the *hydro-extractor*, to get rid of the water more effectually; and lastly, the cloth is dried by being suspended in the air, or by being passed over a series of heated tin rollers, called *steam cans*. In the ordinary course of B., cotton loses about one-twentieth of its weight, and linen about one-third.

After the B. operations have been successfully performed, it is customary to proceed to the *finishing* of the cloth, which consists in, firstly, passing it through a large mangle, where the crumbled piece of cloth becomes smooth; secondly, drawing the cloth over rollers, which cause it to dip in a trough containing starch; thirdly, drying the starched cloth; and, fourthly, passing it through a large mangle or calender, consisting of a series of rollers alternately of polished cast iron and solid paper, and which not only smooth out the cloth, but communicate a fine glazed surface, such as is generally exhibited in bleached cloth when purchased. The cloth intended to be printed upon or to be dyed is not starched or calendered. The operations connected with the B. of cloth by chlorine exert no injurious effect on the health of men and women engaged in them. Some of the bleach-works near Glasgow are of long standing, and give regular employment to several hundred women. The rapidity with which the B. by chlorine can be carried on, may be understood from the fact, that when pressed for time, it is no uncommon thing to bleach, finish, and return to town 1000 pieces of cloth within 48 hours. Valuable in many respects, however, as is the rapidity of B. by means of chemical agents, it must be admitted that the process exerts a certain weakening effect on the cloth, and that, after all, B. according to the old method on the grass is preferable. Grass B. is therefore still in use where time admits, as also for cleaning linen and cotton apparel in domestic washing. See Washing.

Bleaching of Wool is never accomplished by B. powder, but recourse is had to sulphurous acid, which disguises the color of the wool by combining with it to form a colorless compound. Originally the wool is contaminated with a greasy substance called the *yolk*, which naturally exudes from the skin of the sheep, and this unctuous matter mainly consists of a kind of soap soluble in water. The *first stage* in the B. of W. is to get rid of the yolk, which can be done by long-continued washing in water; but as this is tedious, the general plan is to steep the wool in a vat containing one part of stale urine and five parts of water, then boil for some time, and ultimately strain the wool and wash well. The agent in the stale urine which acts upon the yolk is carbonate of ammonia, and this acting upon the oily matters forms a soap which can be readily washed away. When woolen cloth is to be bleached, it is customary to substitute carbonate of soda (washing soda) for the stale urine, and this forms an alkaline lye, which performs the

same part as the carbonate of ammonia. Soap is sometimes used an auxiliary. The *second stage* of bleaching wool is the *sulphuring*, which takes place in a small wooden apartment, in which the damp cloth is suspended in regular folds from the roof to the floor, and a small pan of ignited sulphur being introduced, the doors, etc., are firmly closed. There are little openings round the sides of the chamber, for the admission of air, which can be closed at pleasure. The sulphur (S) in burning take up two atoms of oxygen from the air, forming sulphurous acid (SO_2), which is the bleaching agent; and in about 24 hours the operation is finished, and the woolen material only requires to be thoroughly washed with water, which may contain a little potash or soda. Where the wool is naturally high-colored, it is necessary to repeat the various stages of the process several times before the bleaching is complete. Instead of applying sulphurous acid in the gaseous form, a solution of it in water is sometimes used. An economical method of preparing the solution of sulphurous acid is to introduce a mixture of sulphate of iron and sublimed sulphur into an earthenware retort, and apply a low red heat, when sulphurous acid is disengaged, which is passed through a vessel containing some porous matter, such as moss, to retain mechanical impurities, and then transmitted through a series of bottles containing water, where it is dissolved to the extent of forty volumes of the gas for every one volume of the water. The bleaching of wool by sulphurous acid is not so complete as the bleaching of cotton or linen by chlorine. In the latter case, the color is destroyed, but in the former, the sulphurous acid merely combines with the coloring matter to produce a colorless compound, from which the color can again be revived, either by soaking the wool in a dilute acid, such as sulphuric acid, or a dilute alkali, such as soda. Hence it is that new woolen cloth or garments, such as flannel, blankets, and underclothing, though almost colorless when purchased, yet after being washed several times, return to their natural yellow; for the soda used, as well as the soap which contains potash or soda, destroys the colorless compound formed in the texture of the wool during the sulphuring, and resuscitates the original color.

Bleaching of Silk is carried on in a manner very similar to that pursued in the bleaching of wool. The silk has naturally a good deal of wax, accompanied by oil and coloring matter, enveloping the fiber, and the silk stuffs are repeatedly boiled in water containing a little soap or carbonate of soda, the alkaline nature of the solution being occasionally tempered by the admixture of some bran, which contains an acid. When well scoured and washed, the silk is obtained white enough for many kinds of printing; but where it is desirable that a pure white be obtained, the silken stuffs are introduced into a very weak solution of sulphurous acid, and thereafter thoroughly washed.

Other substances employed in the arts and manufactures are subjected to a process of bleaching; as the rags which are being manufactured into paper (q.v.), the palm-oil which is being converted into candles (q.v.) and night-lights, and the straw (q.v.) of which hats or bonnets are made; but the details of the processes followed in these and other operations, will be described more properly under their respective headings.

Bleaching Powder, a combination of chlorine and dry slaked lime (see Bleaching), was first manufactured on a large scale in Glasgow by Mr. Charles Tennant, who obtained a patent for its preparation in 1799. The substances employed in preparing the chlorine are common salt (chloride of sodium), black oxide of manganese, and sulphuric acid. The operation may be conducted in one or in two stages. The vessel used is a still. The whole apparatus is made of strong sheet lead, or of cast iron, or of grooved stones fitting closely. The more general plan is to have the upper part of lead and the under part of cast iron. The lower third of the still has usually a double jacket, or double walls, between which steam is admitted through a pipe for heating the contents of the still. In using the apparatus, 100 parts of black oxide of manganese (MnO_2) and 150 parts of common salt (NaCl) are introduced by an opening in the top, which is closed by a water-joint; 185 parts of sulphuric acid (SO_3), of specific gravity 1600, are then poured in by a funnel, and on the admission of steam into the jacket, chlorine is evolved, and issues by a tube at the head of the still. The theory of the changes that occur in the still is represented in the following table, there being two equivalents or atomic weights of sulphuric acid for one equivalent of each of the other ingredients:

Chloride of sodium (NaCl)	Cl, Na	Chlorine *escapes as gas.*
Oxide of manganese (MnO_2)	O, Mn, O	
Sulphuric acid (SO_3)	SO_3	
Sulphuric acid (SO_3)	SO_3	
	$MnOSO_3$, Sulpnate of manganese,	$NaOSO_3$, Sulphate of soda,
	left in still.	

The pipe which carries away the chlorine gas is connected with a stone or leaden chamber, into which it enters at one or more points, and the chlorine entering, comes

in contact with dry slaked lime in fine powder, with which the floor of the chamber is covered to the depth of some inches. The chlorine is rapidly absorbed by the lime, which, when the absorption flags, is stirred from time to time by wooden rakes. The process must not be allowed to proceed too quickly, as much heat is evolved during the combination of the chlorine with the lime; and if the temperature of the chamber rises beyond 110° F., the power of combination is very much lessened.

The material which is left in the still as a residuum, consisting of the sulphate of manganese and the sulphate of soda mixed together, is comparatively worthless, and accordingly it is found more economical in large chemical works to divide the process of the manufacture of B. P. into two stages, at each of which the residuum is of commercial use, and can be worked up into marketable products. The first stage is to heat the common salt and sulphuric acid together, when hydrochloric acid (q.v.) is disengaged in the gaseous state, and is received in proper vessels, and the sulphate of soda—from which common soda (q.v.) is prepared—is left in the retort or still. The hydrochloric acid thus obtained is then placed along with the black oxide of manganese in the still, and on the steam-heat being applied, chlorine is evolved and is conducted to the lime chamber, while chloride of manganese and water are left in the still. The decomposition is stated thus:

Hydrochloric acid	Cl, H	Chlorine *escapes as gas.*
Oxide of manganese	O, Mn	
Hydrochloric acid	H, Cl	

MnCl, Chloride of manganese, HO, Water, HO, Water, *left in the retort.*

The chloride of manganese can be returned to the condition of black oxide of manganese, and used again and again. See MANGANESE. The B. P., prepared either in one or two stages, contains, when freshly and fully manufactured, generally between 30 and 40 per cent of chlorine, and the strength of any sample is determined by the process of chlorimetry (q.v.). The composition of B. P. is expressed by the formula $CaCl+CaOClO$, and it is regarded as a double salt of the chloride of calcium and hypochlorite of lime. For its employment as a decolorizing agent, see BLEACHING.

BLEAK, *Leuciscus alburnus*, a small fresh-water fish of the family of *cyprinidæ* (q.v.), of the same genus with the roach, dace, minnow, etc. See LEUCISCUS. It is seldom more than 6 or 7 in. long; in general form it resembles the dace, but is more elongated; the dorsal fin is placed further back, and the base of the anal fin is longer; the nose is pointed, the under-jaw the longest; the scales are of moderate size, and beautifully striated; the back is of an olivaceous green color; the sides, belly, cheeks, and gill-covers, shining silvery white; all the fins nearly white. The tail is forked for half its length. The B. is found in many of the rivers of Europe. On the inner surface of the scales of the B., as of white-bait, roach, dace, etc., a silvery substance, from which they derive their beautiful luster, is found in such abundance as to be much used for making artificial pearls (q.v.), the white beads so common in ladies' head-dresses, and similar ornaments. That obtained from the scales of the B. is preferred to that of the roach and dace, but is inferior to that of the white-bait. It readily separates from the scales when they are soaked for a time in water, and settles to the bottom of the vessel. Small glass tubes are then dipped in it, and it is injected into thin hollow glass beads of the requisite forms and sizes, which are placed in a current of air to dry, and are sometimes further filled with wax.—The B. is singularly liable to be infested by a species of tape-worm.

The B. is an inhabitant of most of the English rivers which contain roach and dace. It is a very restless, active little fish, constantly playing about the top of the water, in search of small flies and other food. A small piece of bread cast into the water becomes speedily surrounded by a shoal of them, and it is amusing to watch them darting to and fro at it with increasing pertinacity. It is not only a pretty little fish, but is, withal, delicate eating; and a dish of well-cooked B. is scarcely inferior to gudgeons. They should be cooked in the same manner as sprats, which they rather resemble in shape and appearance. The best way to catch B. is to angle for them with a single gentle and a light quill-float, the bait being about a foot under water; they may be caught with very small flies, and all the more easily if the hook be pointed with a gentle. They are so active that the angler cannot strike too quickly, and where they abound they form good preliminary practice for the young fly-fisher. The neighborhood of running drains are very favorite resorts for B., and the angler can soon determine if there be any about, by casting on the water a handful of bran, when, if there be any, they will immediately rise at it

BLEBS (allied to *bulb*—Lat. *bulla*, a bubble) are transparent bladders or blisters of the cuticle, which make their appearance in some forms of fever, in erysipelas, and in disorders of the digestive apparatus. There are three varieties of B. recognized by physicians: 1. The mild B., which vary in size from a pea to a hazel-nut, occur on the face, neck or arms, and legs of teething infants, and of young persons who have indulged in unripe fruit. They generally burst, discharge the clear fluid they contain, and heal up again in three or four days. 2. The tedious B., which most commonly affect aged and weakly persons, are seen as an eruption of numerous red elevations, which enlarge to the size of a pea, containing pale yellow serous fluid. These vesicles multiply to such an extent that the sufferer is disturbed at night from the irritation, and slight febrile attacks further debilitate him. 3. The solitary bleb generally selects old women for its victims, and appears, after much tingling of the skin, as one large vesication, and bursts in 48 hours, leaving a superficial sore.

The treatment consists in correcting the secretions, limiting the diet to what is farinaceous and easy of digestion, cooling drinks and tonics. For local treatment, the irritated surfaces are to be soothed by poultices and water-dressings.

BLEDSOE, a co. in s.e. Tennessee; drained by Sequatchie river; 330 sq.m.; pop. '70, 4870—709 colored. Surface rough; productions agricultural. Co. seat, Pikesville.

BLEDSOE, ALBERT TAYLOR, LL.D., b. Ky., 1809; graduate of West Point; served as lieutenant of infantry, but resigned in 1832, becoming professor of mathematics successively in Kenyon college, in Miami university, and in the university of Virginia. During the rebellion he was assistant secretary of war in the southern confederacy. He has published several theological works, has been a frequent contributor to periodical reviews, and is now the editor of the *Southern Review*, a Methodist magazine.

BLEEDING (*hemorrhage*) is one of the most serious accidents which can happen to an animal, and constitutes the most anxious complication in surgical operations. As there is but a limited quantity of blood in the body, and as the sudden escape of a large portion of it is sufficient to cause death, every one should be instructed as to the measures which experience has shown to be the most efficient for preventing a dangerous loss of blood.

B. may be either from a wounded artery or vein, or from a raw surface; and it may be in the form of a general oozing from the surface of a sore or a mucous membrane. We shall consider these varieties separately.

Arterial B. is recognized by the florid redness of the blood, and by its issuing from the cut vessel *per saltum* or by jerks. There are exceptions to this, however. When an artery has been tied, and bleeding occurs from below the ligature, the flow of blood is continuous, and of a dark color.

If a large artery be wounded, the first gush of blood may prove fatal, but in general the patient faints, and nature takes advantage of the respite to place the cut artery in circumstances as favorable as possible to the preservation of life; viz., the artery draws up within its sheath (see ARTERY); the blood, no longer impelled vigorously by the heart, clots between the cut end and the cellular tissue surrounding it; the inner and middle coats not only *re*tract but *con*tract, and another clot forms within the arterial tube. These clots—which, with the faintness and the contraction and retraction of the artery, are termed natural *hæmostatics* (blood-stoppers)—are sufficient in many cases to prevent a recurrence of the B.; but such a happy concurrence is not be depended on, and we must be prepared to adopt some of the many surgical or artificial means for restraining the flow of blood till adhesion (q.v.) can occur between the cut surfaces of the coats of the artery. The principal surgical means are:

Immediate pressure, which may be applied by pressing the finger-tip on the place whence the blood is seen to flow, and may be kept up by pads of lint, or a coin of convenient size wrapped in cloth, and secured with a bandage to the part.

Pressure on the artery above, or as it comes to the cut part. This requires some knowledge of anatomy, but not more than any intelligent person may easily acquire. Thus, pressure on the inside of the arm, about midway between its front and back, will press the brachial artery (q.v.) against the bone, and arrest any bleeding from wounds of the forearm and hand. Pressure on the middle of the groin with a thumb placed crosswise will control the stream of blood in the femoral artery, so that none can escape from any wound below where the pressure is made.

Pressure on the course of the vessel may be very efficiently effected by tying a handkerchief round the limb above where it is injured, and then inserting a stick and twisting it sufficiently tight. This is the principle of the original tourniquet, which was invented by Morel, a French surgeon, at the siege of Besançon, in 1674. He got the idea from seeing how carriers tightened the ropes which secured bales of goods on their carts. It has been modified from time to time. At present it consists of a strap and buckle, a pad which may be adjusted over the course of the artery wounded, or likely to be cut in an operation, and a screw by which the strap may be tightened as the surgeon may deem necessary. See TOURNIQUET. The objections to *pressure* as a means of arresting hemorrhage, are, that it is very painful, that it includes the vein, and thereby engorges the limb with blood, and may cause mortification, if continued for any length of time.

"*Actual*" *cautery*, or hot iron, is occasionally useful in bleeding from a bone, or at some points where pressure cannot be efficiently applied. It is the oldest method of stopping bleeding, and until the 18th c., was much in use; but its abuse and the natural horror felt for it by both patient and surgeon, have almost banished it from the list of surgical hæmostatics. If used, the iron should be at a white heat, the wound pressed for an instant, and then the iron should be held in contact with the bleeding vessel. It causes an eschar or slough, with shriveling of the artery; and if the latter be small, it effectually stops the bleeding, until the eschar drops off, when the vessel may be found still pervious at the wounded part, and the danger of bleeding be as great as at first.

Ligature, or tying the artery, is a very old method of arresting hemorrhage, and certainly the best. It was not used generally, however, in operations until improved anatomical knowledge and more efficient tourniquets allowed surgeons the time necessary for its application. See LIGATURE.

Another method was introduced by the late sir James Y. Simpson of Edinburgh, and has been already extensively used. He termed it acû-pressure, or pressure from a long needle or pin inserted from without, so as to press the artery between it and the tissues. The pins are removed after 24 or 48 hours, the period being proportioned to the size of artery to be secured. This new plan promises to supersede the ligature, in amputations especially, where the vessels can be easily secured, and where occasionally they are found so brittle from disease (see ATHEROMA) as to break under the pressure of a thread.

Venous B. is recognized by the dark color of the blood, and its continuous flow. Pressure is generally found sufficient to arrest it, and it should be applied directly over the wounded part. Ligatures are not used to secure cut ends of veins, as inflammation of the lining membrane of these vessels is apt to spread along them towards the heart (see PHLEBITIS), and produce dangerous symptoms, and very frequently fatal results. There is not the same objection to the use of acû-pressure pins. Of course, if a large vein is wounded in a part where compression cannot be readily applied, the surgeon should have no hesitation as to tying it; and if it is not cut quite through, he may pick up the cut edges in a forceps, and tie them so as to still permit a flow of blood through the vein.

Oozing from cut surfaces of course partakes of the characters of venous and arterial B., but there is no vessel sufficiently large to demand a ligature pressure. The actual cautery and cold may then be used, or one of the many styptics, the strong perchloride of iron may be specially recommended; it may be applied on lint or a sponge; or astringents, such as alum and tannin; there are also the puff-ball, mushroom, agaric, and matico leaves, cobwebs, felt, etc., which act mechanically, and owe their reputation chiefly to the pressure used in their application. Some persons have a congenital tendency to bleed (the hemorrhagic diathesis); if such a one have a trifling cut, or have a tooth pulled, he bleeds perhaps to death. A prudent surgeon will not perform cutting operations on one of a hemorrhagic family.

B. from the free surfaces of mucous membranes occurs when they are much congested. One may have fatal hemorrhage from the stomach, and yet no open vessels may be found after death, even on the most careful examination. In such a case, we must trust to cold and internal remedies, such as acetate of lead combined with opium.

BLEEDING or BLOODLETTING.—Blood may be drawn from a vein (phlebotomy—venæsectio), or from an artery (arteriotomy).

The veins most commonly opened for this purpose are those at the bend of the elbow (see ARM), but those of the lower limbs are occasionally selected. The patient should be placed sitting up in bed, as he may lose a dangerous amount of blood without showing the usual premonitory symptoms, if his head be kept low.

The venous return should now be obstructed by a bandage, and when the veins swell, one should be selected, steadied with the left thumb, and slit obliquely with a lancet; the blood allowed to flow till the desired quantity has escaped, or till faintness comes on. The surgeon's thumb should now be replaced on the cut in the vein, and kept there till the bandage is removed, when a small pad of lint and figure of 8 bandage will sufficiently prevent the bleeding, and the wound will speedily heal.

Phlebotomy was at one time habitually resorted to in inflammatory diseases, or such as were thought so; and even when there was no positive disease, it was often applied periodically at particular seasons, as spring and autumn, as a hygienic precaution. A great change in this respect has taken place in medical practice; as physiological knowledge advances, the opinion seems gaining ground that abstracting blood from a sick man gives him but temporary relief, and renders him less able to combat with the disease. When there is a wound of the cavities of the body with internal hemorrhage, venesection is very useful in lowering the heart's action, and perhaps, according to the old theory, in exercising a *derivative* influence on the wounded vessels. Local B. is effected by cupping and leeches. See articles on these.

Arteriotomy is generally performed on the temporal artery, by a transverse cut about half way through the vessel. When the required amount of blood has been abstracted, it ought to be completely cut across, to allow of its ends retracting and healing. If this precaution is neglected, an aneurism (q.v.) would form. A compress and bandage should be put on the head for a day or two.

BLEEK, FRIEDRICH, 1793–1859; a celebrated biblical scholar of Germany, educated at the university of Kiel, and in Berlin, under de Wette, Neander, and Schleiermacher. In 1818, he was tutor in theology in the university of Berlin. Soon afterwards he published essays on the *Origin and Composition of the Sibylline Oracles*, and on the *Authorship and Design of the Book of Daniel*, in which he attracted attention by solid learning, thorough investigation, and candor of judgment. After suffering loss of place from some unjust suspicions of a political character, in 1829, B. took the chair of theology in the newly founded university of Bonn, where for 30 years he labored with constantly increasing success, by reason of the thoroughness of his investigations, the impartiality of his judgments, and the clearness of his methods of presentation. In 1843, he was promoted to the office of consistorial councilor, a distinction not since conferred upon any theologian of the Reformed church. He died suddenly of apoplexy, having given his regular lecture on the previous day. His defense of the genuineness of the gospel of St. John is regarded as one of the strongest that has yet appeared, and his critical labors on the New Testament are among the most important contributions to the maintenance of the evangelical faith that the time has produced. His greatest work is the *Commentary on the Epistle to the Hebrews*. Many of his critical works were published after his death.

BLEEK, WILHELM HEINRICH IMMANUEL, 1827–75; son of Friedrich; distinguished for researches in the languages of Africa. He was educated at Bonn and Berlin. In 855 he went with bishop Colenso to Natal; the next year he settled at Cape Town as interpreter to sir George Gray, and he died there. Among his works are the *Vocabulary of the Mozambique Language, Handbook of African, Australian, and Polynesian Philology, Comparative Grammar of South African Languages, Hottentot Fables and Tales*, etc.

BLEI'BERG, a t. of Austria, province of Carinthia, in the circle of, and about 8 m. w. of Villach, pleasantly situated in the valley of the Drau, or Drave, near the celebrated Bleiberg (Lead Mountain). The pop. '69, 4061 in number, are chiefly engaged in the mines of the Bleiberg—from which 1500 to 1800 tons of lead are annually obtained—and in washing and smelting the ore.

BLEMYES, or BLEMMYES, an ancient African people, in and around the Libyan desert. In the 2d c., while Egypt was under Roman rule, they made predatory incursions into that province, and Diocletian made important concessions to them. They were powerful and annoying as late as the 7th c., and old authors tell strange stories of their savage appearance and habits. It is supposed that the Ababdeh, the Bishareen, and other tribes are their descendants.

BLENDE (Ger. *blenden*, to dazzle), a name given to a number of minerals composed chiefly of sulphur and of certain metals, all or almost all of splendent luster, at least in fractures and the faces of crystals. It is also very often popularly applied more exclusively to one of these minerals, to which alone, perhaps, it originally belonged, ZINC B., or GARNET B.; also called, according to its chemical composition, *sulphuret of zinc*. Among English miners, it is known as *black-jack*. It is abundant both in primitive and in secondary rocks in many parts of the world, and is often associated with galena (q.v.), or lead-glance. It contains about 66 parts of zinc and 33 of sulphur, and is used as an ore of zinc (q.v.); but the reduction of it is attended with difficulty, which much diminishes its value. It is usually brown or black, sometimes red, yellow, or green. It occurs both massive and crystallized in rhomboidal dodecahedrons, octahedrons, and tetrahedrons. Macles, or twin crystals, are remarkably common. It is very brittle; before the blow-pipe, it decrepitates violently, but only fuses on thin edges.—MANGANESE B. is a rare mineral, composed of sulphur and antimony.—ANTIMONY B., or *red antimony*, is also a rare mineral, composed of sulphur and antimony.—RUBY B. is a name sometimes limited to pyrargyrite, or red silver (see SILVER, ORES OF); sometimes extended as a sort of generic term to include a number of other minerals composed of sulphur and metals, among which are cinnabar (q.v.), realgar (q.v.), and orpiment (q.v.).

BLENEAU, a village of France, in the department of the Yonne, about 29 m. w.s.w of Auxerre, celebrated as the place where Turenne gained a victory over the Prince de Condé in 1652. Pop. '76 1433.

BLENHEIM (Ger. *Blindheim*), a village of Bavaria, 23 m. n.n.w. of Augsburg, memorable in connection with Marlborough's great victory over the French and Bavarians, Aug. 13, 1704. The battle, however, did not actually take place here, but at a village in the vicinity called Höchstädt, and is known to the Germans by that name. France and Bavaria, on the one hand, stood opposed to Holland, England, Austria, Savoy, Portugal, and the German empire, on the other. The French and Bavarian army consisted of 56,000 men, commanded by Tallard, Marsin, and the elector of Bavaria. Opposed to it was an army of 52,000 men, under the command of Marlborough and prince Eugene. The French and Bavarian generals had no idea that the allies would act on the offensive, and accordingly, when, about two o'clock in the morning, on the 13th Aug., the line of the allies put itself in motion, they believed that it was about to retreat. Even at seven o'clock, when the heads of the eight columns advancing under Eugene and Marlborough became visible, Tallard regarded the whole proceeding as a stratagem to cover the retreat. When the mistake was discovered, the army was hastily

drawn up in battle-array, and fought with dauntless courage; but at five in the afternoon Marlborough broke through the line of battle, and won a victory most complete and decisive. The French and Bavarians left about 10,000 killed and wounded on the field, vast numbers were drowned in the Danube, and about 13,000, including Tallard, were taken prisoners. Altogether their loss was estimated at between 30,000 and 40,000; 120 pieces of cannon and 300 standards were captured. The loss of the victors amounted to about 5000 killed and 8000 wounded. Near to B., also, the French defeated the Austrians in 1800.

BLENHEIM DOG, or MARLBOROUGH DOG, a small and very beautiful variety of spaniel, much resembling the King Charles spaniel (q.v.) in form and general appearance, but differing in the color, which is white, with orange or flame-colored markings. In weight it should not exceed five pounds. The B. spaniel is the *pygmæ* of Buffon. It derives its English name from Blenheim palace in Oxfordshire, the seat of the dukes of Marlborough, where the breed has been preserved since the beginning of the 18th century. These dogs are sometimes sold at an enormous price.

BLENHEIM HOUSE, near Oxford, the seat of the duke of Marlborough, erected at the public expense in the reign of Queen Anne as a testimony of gratitude to the victor of Blenheim (q.v.). £500,000 was voted for the purpose, but that sum did not suffice for the completion of the work. The royal estate of Woodstock, in which it stands, was granted at the same time. The building was designed by sir John Vanbrugh, and is a grand though heavy monument of his powers as an architect. The length of the principal front from wing to wing is 348 feet. The interior is proportionally magnificent, and the collection of paintings is one of the most valuable in Britain. Among the objects of interest in the grounds are a triumphal arch, and a column 130 ft. high, surmounted by a statue of Marlborough. An inscription on the pedestal, written by Bolingbroke, recites the public services of the hero. The manor of Blenheim park embraces a circuit of about 12 miles.

BLEN'NERHASSET, HARMAN, 1764–1831; b. England. He was bred to the law in Ireland, but sold his estates in Ireland for more than $100,000 and came to the United States. He remained in New York a short time, and finally settled on an island in the Ohio river, just below Parkersburg, Va., where he built a delightful residence, and dispensed the most elegant hospitality. Here Aaron Burr interested him in his scheme for seizing Mexico, where, in case of success, Burr was to be emperor, and B. a duke and ambassador to England. B. expended large sums in fitting out an expedition, and, though discouraged when he learned Burr's real design, the intriguer had such influence with his wife that B. still adhered to him. He was arrested and held for trial, but Burr's acquittal set all the suspected persons free. His beautiful island and home had been sacrificed by creditors, and he returned to Natchez a bankrupt. He undertook a cotton plantation, but the war with England ruined commerce, and he then removed to Montreal, where he practised law. In 1822, he went to Ireland to secure certain property, but failed, and continued to fail in every project. In his last years he was supported by a sister who left a small estate to his wife and children. B. married a daughter of Gov. Agnew of the Isle of Man. She was a woman of superior culture, and authoress of several poems, among them *The Deserted Isle*, and *The Widow and the Rock*. She came to the United States after her husband's death, and petitioned congress for a grant in reparation of her great losses, but she died before final action was taken, and was buried by the sisters of charity in New York. A son, Joseph Lewis, was a lawyer in Missouri. The *Blennerhasset Papers*, with a memoir, were published in 1864.

BLENNORRHŒ'A (*blenna*, mucus; *rheo*, to flow) is a medical term for an unusually copious discharge from any mucous membrane; but as it does not completely express the nature of such fluids, modern writers do not often make use of it. *Mucus* is a pellucid, ropy substance, which, according to sir James Paget, "has no corpuscles or organized particles" of its own. In those discharges termed blennorrhœal, on the other hand, there is a mixture of epithelial scales shed in large quantities from the mucous membrane (mucous cells), and occasionally pus cells. In B. of the lachrymal sac, or what is called "watery eye," if the inner corner of the eye be pressed by the fingers, an opaque, milky fluid will appear between the lids, instead of the transparent tears which are present when the lachrymal apparatus is in health. After inflammations of the genito-urinary mucous membrane, a gleety discharge frequently occurs, and continues for a long period. The treatment consists in establishing a robust state of health by tonics and the preparations of iron, fresh air, and careful regimen, with astringent lotions applied directly to the mucous membrane, such as alum, tannin, etc., to lessen the quantity of the secretion, and occasional caustic stimulants, as the nitrate of silver, to alter the depraved condition of the secreting membrane.

BLEN'NY, *Blennius*, a genus of acanthopterygious (q.v.) fishes, the type of a family, *blenniidæ*, very nearly allied to the family of *gobiidæ* (see GOBY), and by many naturalists included in it. To the B. family, the wolf-fish (q.v.) and the gunnel (q.v.) or butterfish are referred. The fishes of this family are generally remarkable for the abundance of slimy matter with which their skin is covered. Many are destitute of scales. The body is generally of an elongated form. They have only one dorsal fin, which, how-

ever, seems in many of them as if composed of two parts. They are distributed in the seas of all parts of the world.—The true blennies are small fishes, living in shoals, which do not consist of great numbers, frequenting rocky coasts, and often found in pools left dry by the tide, or even among the wet sea-weeds, among which they are capable of subsisting for a much longer time than that of the absence of the tide. They possess the power of using their ventral fins to aid them in moving about among rocks and sea-weeds. They have a fringed appendage over each eye. They are seldom thought of as an article of food, but are much in request for the aquarium, on account of their tenacity of life and their activity. They feed chiefly on small crustaceans. Several species are found on the British coasts.—Many of the B. family retain their eggs within the oviduct until they are hatched, so that the young are produced alive, and capable of seeking food for themselves. An example of this is found in the viviparous B. (*Zoarces viviparu*) of the British coasts.

BLÉRÉ, a t. in the department of the Indre-et-Loire, France, is situated on the left bank of the Cher, which is here crossed by a bridge, said to owe its origin to Henry II. of England, about 15 m. e.s.e. of Tours. B. is the entrepôt for most of the traffic on the Cher. Pop. '76, 2043. In its vicinity is the castle of Chenonceaux, the residence purchased by Henry II. of France for the celebrated Diana of Poitiers, who lavished much money on its embellishment, as did also Catharine de' Medici, after she had dispossessed Diana. In 1733, it became the property of M. Dupin, whose wife, by her beauty and wit, attracted to the castle almost all the distinguished literary and scientific men of that day, including Montesquieu, Voltaire, Fontenelle, Buffon, Bolingbroke, and Rousseau. The castle escaped the fury of the revolution, and is still in a good state of preservation. Among the curiosities shown to the visitor is the mirror used by Mary Stuart (queen of Scots) on her marriage with the dauphin.

BLESSED THISTLE. See THISTLE.

BLESSINGTON, MARGARET, Countess of, b. Sept. 1, 1789, at Knockwiet, near Clonmel, Tipperary co., Ireland, where her father, Edward Power, was settled. At the early age of 15 she was married to capt. Farmer, and shortly after his death, to Charles John Gardiner, earl of Blessington. With him she took several extensive journeys on the continent, where, as well as in London, she gathered around her all the most distinguished men of the time. In Genoa, she formed an intellectual friendship with lord Byron, and afterwards resided in Paris, until the death of her husband, in 1829. The latter left her a good fortune, which enabled her to gratify her literary tastes. She held a little court of her own, at her family mansion, Gore house, Kensington, a suburb of the w. end of London. Her celebrated soirées were frequented by many of her distinguished contemporaries. Her subsequent connection with count d'Orsay placed her in an equivocal position as regards society, and, consequently, on the accession to power of Louis Napoleon, with whom both were intimate, they left England for France. Her ladyship died at Paris, 4th June, 1849. She was the authoress of two works of little importance, the *Idler in France*, and the *Idler in Italy*. Her only valuable production is her *Conversations with Lord Byron* (1834), which helped to place the poet in a more favorable light before his countrymen.

BLETCHINGLEY, a t. in the s.e. of Surrey, 20 m. s. of London. Pop. '71, 1916, chiefly agriculturists. Many Roman coins have been found in the vicinity. Near B., 2000 to 3000 tons of fuller's-earth are raised annually. In cutting the B. railway tunnel, the fossil bones of the iguanodon, an extinct reptile, were found.

BLETS, rotten spots in apples, pears, and other fruits. The rotting of such fruits is often called *bletting*. It takes place chiefly by the decomposition of the protein (q.v.) compounds which the fruits contain, and the fermentation of the sugar; carbonic acid is formed; and the fibers of a fungus can be discovered by the microscope pervading the bletted part, to the rapid extension of which they no doubt greatly contribute, although it by no means follows that the presence of the spores or seeds of the fungus should be regarded as the original cause of the decay.

BLICHER, STEEN STEENSEN, one of the most distinguished of modern Danish poets and novelists, was b. in 1782, at a village of Viborg; and took his theological degree at Copenhagen in 1809. He remained with his father, himself a pastor in Jutland, till 1819, when he obtained a living, which he exchanged, in 1825, for a better. Independent in character, and belonging neither to the poetical nor scientific circles of the capital, he was long known only as the successful translator of Ossian, 2 vols. (1807–9). His *Sneeklokken* (1826), and still more, his contributions to the monthly periodical *Nordlyset*, brought him into fuller notice; and in 1829, his *Jydske Romanzer* had a great measure of success, and his *National Noveller*, giving a poetical and faithful picture of country life in Jutland, were even better received. As a poet, B. is thoughtful, tender, and eminently national, but he lacks objectivity. His novels appeared in 5 vols. (Copen. 1833–36), his poems in 2 vols. (1835–36), and these were followed by *Samlede Noveller og Dichte* (1840), and *Gamle og nye Noveller* (1847–48), etc. He died in 1848. Specimens of B. are given in *The Danes sketched by Themselves*, by Mrs. Bushby (1864).

BLIDAH, a t. of Algeria, in the province of Algiers, about 30 m. s.w. of the city of that name. It is beautifully situated on the borders of the fine plain of Metidjah, is sur-

rounded by gardens, and is a prosperous and rapidly growing place. It was occupied by the French in 1838. Pop. about 9000. It is a station on the first line of railway in Algeria. The foundation-stone of the railway station was laid in 1859, in the presence of a large number of Arabs, who regarded the ceremony with intense interest.

BLIGH, WILLIAM, an English admiral, b. 1753, celebrated in connection with the mutiny of the *Bounty*. Having made a voyage round the world under capt. Cook, he was sent out, Dec. 23, 1787, by the British government, as commander of the ship *Bounty*, to Tahiti, there to collect bread-fruit-tree plants, and thence sail with them to the West India colonies, where government was anxious to introduce them. The ship arrived at her destination in Oct. of the following year, and in six months after was ready to sail for Jamaica, with 1015 plants on board. Partly on account of their demoralization by their lengthened residence on so charming and productive an island, and partly owing to the harsh and tyrannical treatment they met with from their commander, a part of the crew mutinied, after they had been 24 days out, on the 28th April, and forced the captain and 18 men into the ship's launch, which they cast adrift, turning their own course back to Tahiti, and ultimately settling on Pitcairn's island (q.v.). The captain and his companions, who had very little provision, and no sextant or map, arrived, after most incredible hardship, at the island of Timor, on the 14th June, a distance of 3600 nautical m. from the point where they were abandoned. To the skill and prudence of B., the fact that not a single life was lost, is chiefly to be attributed. On B.'s arrival in England, a man-of-war, under capt. Edwards, was sent, at his instance, to capture the mutineers. Some of them were seized; the rest had escaped to Pitcairn's island, with Fletcher Christian, the leader of the mutiny. Their place of refuge, however, was not discovered until 1808, when an American ship accidentally touched at the island. At that time, drunkenness, debauchery, and unbridled passion had left only one of the mutineers, John Adams, remaining. Their fortunes here were made the subject of a poem by Byron, entitled *The Island; or Christian and his Comrades*. B. was again sent out to collect bread-fruit trees, and convey them to the West Indies, in which he was completely successful. In the French revolutionary war, B. commanded a ship of the line, but again exciting the disaffection of his men by his harshness, they mutinied, and ran the ship into a French harbor. In 1806, B. was appointed governor of New South Wales, but his conduct here was so tyrannical as to cause universal dissatisfaction; and in 1808, unable to tolerate his rule, the civil and military officers of the colony summarily terminated his government by arresting him. He died in 1817.

BLIGHIA. See AKEE.

BLIGH ISLANDS, that portion of the Feejee archipelago originally discovered by Tasman, in 1643, which was seen by capt. Bligh of the *Bounty*, during his wonderful voyage in an open boat. The group lies in nearly 180° of long. and 15° 30′ to 19° 30′ s. lat.

BLIGHT, a diseased state of the cultivated grasses, especially of the cerealia. The term has been very vaguely and variously used, having, in fact, been applied to almost every disease of plants caused by the condition of the atmosphere, or of the soil, the attacks of insects, parasitic fungi, etc. It is frequently limited to the disease in wheat and other grains, which is also called SMUT-BALLS, BUNT, PEPPER BRAND, or STINKING RUST, in which, while the grain retains its usual form and appearance, the interior of it is filled with a powder of a very fetid odor, consisting of balls so minute that it is calculated that four millions of them may exist in a single grain. These are a parasitic fungus, *uredo caries* (*U. fœtida* of some botanists). See SMUT.—The name B. has been frequently applied to diseases which seem to be caused by errors in the manuring of land, by which crops are often seriously injured. Unhealthy plants are most liable to be attacked by parasitic fungi, and by aphides and other insects, to which the origin of the evil has often been, in all probability, erroneously ascribed. Mr. Berkeley, a high authority on such subjects, also states that "there is a kind of B. sometimes very prevalent, which has been referred to fungi, but which is, in fact, nothing more than an excessive development of the epidermal cells, which are no longer kept within bounds by the real cuticle," but become "elongated and frequently branched in various ways," so as to form spongy or mealy patches, which are sometimes in such abundance as from their bright color or peculiar aspect to attract general notice." He adds that this is most common on woody plants, as vines and hawthorns, but that something analogous is to be seen on a few herbaceous species, "a mere hypertrophy of the epidermal cells, or, indeed, mere fascicles of pubescence." This kind of B., however, does comparatively little injury.

BLIND, THE, those who are either partially or totally deprived of the sense of sight. Only a few are born blind, the greater number becoming so by accidents, small-pox, or diseases of the eye (q.v.), so that more than one half are above the age of fifty. Blindness prevails most in tropical, and least in temperate countries; more in the eastern than the western hemisphere. There are about 30,000 in the British isles. The balance between the outer and the inner world being disturbed, there is a tendency among the blind to self-consciousness, self-opinionativeness, and a desire to become the objects of attention,

and, if possible, surprise, if not admiration; hence there is more avowed infidelity than in any other class, although probably much of it is assumed, to attract attention, and display their controversial powers. As these tendencies are not strong in individuals, but become intensified when they are congregated together, it is now generally admitted that the more they associate with the seeing, and the less with one another, the better.

The first institution for the blind was founded in Memmingen by Weef VI., in 1178; the second, in Paris, by St Louis, in 1260; the first for the employment of the adult blind was opened in Edinburgh by Dr. Johnston, in 1793. There were in 1873 148 institutions for the blind in the world, two thirds of which have only recently been established. Though the blind, in general, are more or less dependent, yet many have earned a comfortable living, and even attained distinction in departments generally supposed to be to them inaccessible. The employments most adapted to their abilities are the making of baskets, brushes, mattresses, rugs, and such like; and for the women, sewing, knitting, and hair-plaiting. Many also have successfully competed with the seeing as musicians, music-teachers, and piano-tuners.

PRINTING FOR THE BLIND.—The first embossed book for the use of the blind was printed in Paris in 1784, by M. Valentine Houy, from flat movable letters, which his pupils had been previously taught to put together and read. Founts of types were cast and books printed; and having been approved by the academy of sciences, and exhibited before the royal family at Versailles, the art created at the time a great sensation. Large editions of a few volumes were printed at great expense; but as they were not easily read, and were used only for exhibition in the Paris institution, the interest soon died away, and the greater part of the editions was long after sold for waste-paper.

Printing can never be to the B. what it is to the seeing, and is chiefly of use for those gems of literature which can be read and re-read with interest. It is questionable, therefore, whether the art, after falling into abeyance for about 40 years, would have been permanently revived had it not been for the Bible, the book least wanted in Paris, but most wanted in Britain and America.

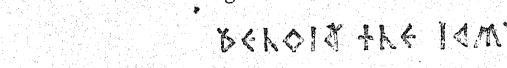
The merit of reviving it in this country is due to Mr. James Gall, of Edinburgh, who having in 1826 seen specimens of the Parisian books, and obtained a box of the types, was deeply impressed with the importance of putting the Bible into the hands of the blind, to employ their vacant hours. Being himself a printer and publisher, he at once saw the cause of the failure in France, and set himself to improve the alphabet, so as to make it more sensible to the touch. The following is a specimen of the Parisian type at that time:*

The principles which he laid down for his guidance were these: *First*, that the common alphabet (modified so as to be easily felt) is the only safe basis on which a literature for the blind can rest. He did not believe that any arbitrary character would be universally adopted or permanently adhered to; and as he looked forward to the blind being taught in common schools, not only to read, but to communicate with their seeing friends, he thought it indispensable that the books should be legible to all. *Second*, that the printing should be so large and legible that the adult blind should be able to read it *fluently*. It would have been easy to print books in a small type, which could be read by children only, and which, besides being much cheaper, would have astonished the public more; but he was of opinion that unless the adults were able to read easily, the books would not be read in private, and the object he had in view would not be attained. He also unhesitatingly preferred the common (low-case) alphabet to the capitals, which, though sufficiently well-known, are not fitted for the use of the blind. Their symmetry and general uniformity, which specially adapt them for titles and inscriptions, render them unsuited for common and easy reading, either for the blind or those who see. They are even less adapted for the finger than the eye, because the eye can see the interior parts of the letters by which they are distinguished; whereas the finger can feel only the exterior form. Thus E H K M N X Z appear to the finger as a succession of squares, O C G Q as a succession of rounds.

In 1827, after much study and many experiments, Mr. Gall printed his "first book" for teaching the blind to read in a triangular modification of the common alphabet. The embossing was in high relief, and although it presented rather a rude appearance, being printed from wooden types, it excited great interest and wonder when it was found that the blind could read it easily with their fingers. This was followed by other little volumes, including a series of *Scripture Statements*, and a condensed *Epitome of Old Testament History*. These were received with so much favor, that, in 1829, he issued a prospectus for the publication of the Gospel of St. John, at one guinea, which was to pay not only for the copies, but preliminary expenses. This work was printed in 1832, but was not published till 1834; the delay being caused by the efforts of some zealous friends to induce him to adopt some arbitrary alphabet before printing the Bible, which,

* In this, as in all the specimens which follow, the size is reduced to one quarter—that is to say, they are half the length, and half the breadth of the originals.

however, he firmly declined to do. The consequence was that, in 1833, the Scottish society of arts offered a gold medal, value £20, for the best alphabet for the blind; and this, although it increased the public interest in the newly revived art, had also the effect of paralyzing Mr. Gall's efforts, by preventing the public from giving him support until the result of the competition thus created had been ascertained. It would have greatly strengthened his hands if, as he hoped, they had awarded him the prize, for there was no other in the field; but, after waiting two years, he could wait no longer, and in 1834* he published his great work, *The Gospel by St. John*, which was the first book of the Bible which had ever been printed for the blind in any language. This volume was printed in a type so large and legible, that some of those whom he had taught were able at the public meetings to read any passage put before them through six plies of silk between the book and their fingers.



To make known the literature thus provided for the blind, Mr. Gall visited England and Ireland, as well as different parts of Scotland, teaching the blind who were brought to him to read and write in a few lessons. The writing apparatus will be described hereafter. Letters thus written were transmitted by post, and, as the same alphabet was used both inside and without, not only were the sealed contents read by the blind to whom they were sent, but the addresses also were read by the postman who delivered them. Great interest began to be excited throughout Britain, and extended even to foreign countries. Abbé Carton was sent by the Belgian government to visit Mr. Gall's establishment, and returned to set up a printing-press in Brussels, which has continued to supply books for that kingdom. Dr. Howe also, from Boston, visited Scotland, and having received from Mr. Gall all the information which he could supply, established, on his return to America, a printing-press in the Perkins institution. In 1834, he published the Acts of the Apostles, and completed the New Testament in 1836. About the same time, Mr. Jacob Snider, of Philadelphia, not knowing what had been done elsewhere, published the Gospel by St. Mark in 1834; but, as he had unfortunately adopted the capital alphabet, his books could not compete with Dr. Howe's; and, after printing the gospels and a few other volumes, his press ceased to be used. Dr. Howe, on the contrary, had adopted an angular modification of the common alphabet, similar to, but much smaller than Mr. Gall's, and with that printed the whole Bible, besides an ever-increasing number of other volumes in all departments, with which he continues to supply the whole of the United States. In Paris, also, the art was revived with great vigor, and a number of printing-presses were established in different parts of the continent.

Having thus succeeded so far as the blind were concerned, Mr. Gall was next anxious to improve the printing and lessen the cost, so that any village printer could make, it part of his ordinary trade, without requiring subscriptions from the public. By careful experiment, and with the help of his son, he was enabled to make the alphabet assume more of its usual form without losing its tangibility, and to enrich the sentences by the introduction of initial capitals for proper names, etc., as in common books. But the most important improvement consisted in the use of serrated types, by which the letters were formed of dots ⋯⋯ instead of lines. By this means the impression was not only sharper and more easily felt, but also more permanent, being better supported, as if by a series of arches, ∧∧∧∧∧ like corrugated zinc roofs. It was also found that when the paper was thus semi-punctured instead of being embossed, the common printing-press could print the sheets with half the pressure, and in half the time; and as the paper did not need to be nearly so thick as formerly, the books could be produced at one half of their former cost. In 1836, therefore, he offered to societies and publishers to print books for the blind in the improved type at so much per sheet, as an ordinary business transaction, without either subscriptions or donations. Of this offer the London Sunday-school union, the Religious tract society, and the British and Foreign Bible society, availed themselves in 1837, and in 1838 he printed for the British and Foreign Bible society the Gospel by Luke and the Acts of the Apostles (two of the eight volumes of the New Testament), which they were able to sell at 4s. each; and here ended Mr. Gall's labors for the blind, extending over a period of twelve years, during eleven of which (1826-37) he had been alone in the field.

As the institutions for the blind in those days "had not hitherto (as they expressed it) patronized any device of this kind," Mr. Gall had to contend single-handed with all the apathy and incredulity which every new thing has to encounter. But now the tide had turned, readers were multiplying over the country, schools for the blind were beginning to be formed, the institutions abroad had all "patronized the device," and printing-presses were busy both in America and on the continent; so that when the Sunday-school union, the London tract society, and the British and Foreign Bible society began to publish class-books, tracts, and Bibles for the blind, they all at once became con-

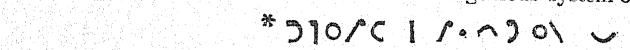
* The award was not made till 1837. Sixteen arbitrary alphabets had been sent in, all of which were rejected, and the prize was awarded to a Dr. Fry, of London, who had suggested the use of Roman capitals, which, in 1834, had already been tried in America.

vinced of its importance, and took it up with so much energy, that there was now no longer any danger of its being abandoned; and as Mr. Gall's work was thus practically accomplished, it was neither his interest nor his inclination to compete with them.

The first, and by far the most energetic, of the number was Mr. John Alston of Glasgow, who, having established a printing-press in the blind asylum, of which he was treasurer, printed in 1837 the Gospel by St. Mark in the same type in which (unknown to him) it had been printed in 1834 by Mr. Snider in Philadelphia. Through his influence it was at once adopted in the other institutions throughout the kingdom; and, having thrown himself with much enthusiasm into the work, he very soon raised funds by which he completed the New Testament in 1838, and the whole Bible in 1840. To him, therefore, belongs the honor of having printed the first complete Bible for the blind in any language, because Dr. Howe of America, although he commenced the work earlier, did not finish it till 1842. The effect was immediate and decisive, rivalry was extinguished, hundreds of the blind were brought under instruction, and reading was thenceforth acknowledged to be a necessary department of the education for the blind.

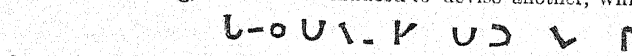
If Mr. Alston had adopted a modification of the low-case alphabet, and more especially, if he had printed his books in a much larger type, they would have been an unspeakable blessing to the blind in this country; because, not only would they have been universally adopted, but they would have continued to be used, and he would thus have prevented the lamentable confusion into which the printing for the blind in this country has fallen. But unfortunately Mr. Alston, being encouraged by the decision of the Scottish society of arts, which he himself had very much helped to influence, fell into the double error of adopting the Roman capitals for his alphabet, and making his type too small. The consequence was, that a reaction very soon took place, the blind themselves being the first to rebel. The want of sufficient legibility was in their judgment a fatal objection, and outweighed all other considerations. Even the large amount of money that had been expended, and the extensive libraries that had been formed through Mr. Alston's energetic labors, they were prepared to sacrifice, in order to obtain books which they could read with ease.

The second in the field, or rather simultaneously with Mr. Alston, was Mr. Lucas of the Bristol institution, who invented a most ingenious system of stenographic printing



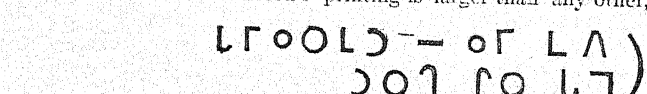
with arbitrary characters and numberless contractions, by which he secured largeness of type and at the same time diminished the size of the books. He had in 1837 printed the Gospel by St. John, and in 1838 the Acts of the Apostles, but during the triumph and rapid multiplication of Mr. Alston's books little attention was paid either to him or his system; but when the tide turned, and legibility became the great desideratum, the value of his invention became apparent, and in 1839 a society was formed to aid Mr. Lucas in printing the Bible and teaching the blind to read upon his system. The blind were delighted with his books; his printing establishment was removed to London; large funds were collected; and the whole Bible and many other books were printed. (*Price of the New Testament*, £2.)

The third competitor was Mr. Frere of London, whose objections to Mr. Lucas' system were so strong, that he was induced to devise another, which was (as he himself



described it) "a scientific representation of speech, the alphabet containing only one character for each of the simple sounds of the English language." This opinion was shared by another large section of the friends of the blind; and accordingly, in 1839, another society was formed, another Bible was printed, another literature was created, and another illustration was supplied of the difficulty of securing the universal and permanent adoption of any arbitrary character for the blind. Mr. Frere had also the merit of inventing the "return lines"—that is to say, the lines in his books are read from left to right, and from right to left alternately, the letters themselves being reversed in the return lines. He also devised a cheap and very ingenious method of setting up and stereotyping his books, the letters being formed of small bits of bent wire laid on a tin plate, and fastened with heat. (*New Testament*, £2 10*s*.)

The fourth competitor was Dr. Moon, of Brighton. He, too, uses an arbitrary alphabet, some of the characters resembling or suggesting the letters which they represent. He has also adopted Mr. Frere's "return lines," but does not reverse the letters as Mr. Frere does. Mr. Moon's printing is larger than any other, and therefore more



easily felt. This is a great advantage to beginners, and to those whose touch is very obtuse, although no doubt his books are on that account both bulky and expensive. Nevertheless, this is by far the safest side on which to err, and therefore Mr. Moon's

books are great favorites with the blind. A society, having numerous branches, has been formed to extend this system, and the blind are sought out and taught in their homes. Many more blind persons can read on Dr. Moon's system than on any other. Besides the Bible, Dr. Moon has printed (embossed) an extensive literature, both in English and in many foreign languages.

A fifth system has been recently imported from Paris, invented by M. Braille, which consists of the sixty-two varieties of form which six dots, ⁘, can be made to assume by the omission of one or more of them. This supplies not only the letters of the alphabet,

but numerous other signs, of which he makes valuable use. There are two advantages which it possesses over all the others, and which it is supposed will cause it to supersede them. The first is, that it can be written easily by the blind themselves, by an apparatus to be afterwards described. The other is, that it affords the best method of writing and printing music for the blind which has yet been discovered.

A sixth system is an improvement on Braille, by Mr. Wait of New York, which, it is confidently predicted, will supersede all the others. The signs, like M. Braille's, are produced by six dots, but they are placed horizontally, thus, :::

At present, it is impossible to predict the triumph of any of these systems, as their respective advocates are not only determined, but able to keep their ground. But as recent legislation has made provision for the education of the blind in common schools, where the influence of rival societies and extraordinary geniuses, who are not the best guides for their less talented brethren, will not be felt, it is not improbable that some common system will gradually come into general use. In the report of the royal commissioners of the exhibition of 1851, surprise is expressed that Mr. Gall's labors should have been so summarily set aside, and they recommend now the universal adoption of Dr. Howe's books.

Writing for the Blind.—This is of two kinds; first, writing to be read *by the blind;* and, second, writing by the blind, to be read *by the seeing.* Messrs. Milne and M'Baine of the Edinburgh asylum invented the "string alphabet," by which they were enabled to communicate with one another. The letters were represented by different kinds of knots tied upon a cord singly or combined. This was superseded in 1838 by Mr. Gall's writing stamps, which, as they can be made to any pattern, have been much used. The paper is placed on a cushion frame, and a barred guide placed over it. The stamps are made of pins fixed in wood, and when pressed through thick writing-paper, produce a raised letter on the other side.

M. Braille's system of writing corresponds with his alphabet. Cartridge paper is placed over a grooved plate, with a guide having two rows of oblong holes. A blunt point forces the paper into the grooves, so as to produce the dots which form the letters on the other side. This is by far the most legible writing which has yet been provided for the blind, and is a strong recommendation of his alphabet for printing.

There are two methods of writing by the blind to be read by the seeing. The first is by Mr. St. Clair, a teacher of music in Edinburgh; the other is Mr. Gall's typlograph. In both processes the writing is produced by a hard pencil with a fine point, or by a blunt bodkin moving over carbonized paper, which deposits the blacking on the paper wherever it is pressed. Mr. St. Clair's guide consists of a line of small square holes, each of which represents a letter or a space. The steel point enters each hole, and makes

a letter, guided by the four sides. Mr. Gall's typlograph is a much more perfect instrument, and can be made to imitate any size or style of writing; but it is not so easily made. It consists of a hole of this shape, , cut in a thin brass guide, which slides freely between two wooden fillets, united at each end. The upper half of the hole is used when the guide leans against the lower fillet, and the lower half is used when the guide leans against the upper fillet. When the steel point has traced a line round the upper or lower half of the hole, it is stopped by the small projection in the middle of the right side—thus:

Arithmetic for the Blind.—There are three methods: 1. The *Parisian.* Embossed types are dropped into square holes in a perforated board, and read by the finger. 2. *Saunderson's.* Angular pins are dropped into angular holes, and indicate the figures

according to their position. The pentagonal is the most convenient form, because one pin having the two ends different can represent ten ciphers. 3. *Gall's* requires no apparatus at all, the ciphers being represented by common pins stuck into a quilted cushion or cloth of any kind, and the lines by twine stretched across—thus:

1 2 3 4 5 6 7 8 9 0

Although reading, writing, and tangible arithmetic are of great importance to the B., yet oral instruction is that upon which we must chiefly rely for their education. For that reason, the recent education act for Scotland, under which blind children may be educated in common schools, will be a great blessing to them.

BLIND, KARL, b. 1820; a German politician, arrested for political offenses while a student at Heidelberg, imprisoned, and subsequently banished for participation in the affair of 1848. He was also expelled from Alsace for complicity in the Paris insurrection. In Sept. after the conflict at Staufen, he was taken prisoner (with Struve) and sentenced to eight years' imprisonment. Eight months afterwards he was set free by a mob and went to Carlsruhe, thence to Paris, and thence to Brussels, being everywhere repelled, until, in 1852, he found rest in London. There for several years he kept up his violent political agitations, but after 1836 he became more quiet, a consequence, perhaps, of the death of a step-son in the Berlin affray of that year. He has published a great number of political essays, and brief articles on history, mythology, and German literature. In 1875, in the streets of London, an attempt was made upon his life by a political enemy. Among later works of his are *Fire-burial among our Germanic Forefathers; a Record of the Poetry and History of Teutonic Cremation, Yggdrasil, or the Teutonic Tree of Existence*, and biographies of Freiligrath, Ledru Rollin, and Francis Deak.

BLIND AGE. When a besieged town has little or no bomb-proof shelter, screens are sometimes used called B., made of timber and earth; or of trees inclined towards each other, or placed in an inclined position against walls.

BLIND COAL. See ANTHRACITE.

BLIND FISH. See AMBLYOPSIS.

BLINDNESS may arise from any cause intercepting the rays of light on their way to the optic nerve, or from disease of the optic nerve, or of that part of the brain connected with it. B. may vary in degree; it may exist from birth, or be the result of extreme old age. It may only be present during the day or the night, or a few weeks of the year, or it may be permanent.

Congenital B. is generally from some deficient development of the nervous apparatus, and is detected by the child being indifferent to light, and throwing its head from side to side. Occasionally, but very rarely, the power of vision is subsequently developed. Amaurosis has been already described.

Opacity of the vitreous humor, or of the crystalline lens—the latter is generally known as cataract—causes B. which comes on gradually. The patient with cataract can see best in the evening, or when the pupil is dilated, as then some rays of light are able to enter by the side of the opacity. The B. from cataract is seldom so complete as to prevent the person from distinguishing day from night, or from being aware of opaque bodies passing between him and the light (see CATARACT). Opacities of the cornea, if extensive, or in the axis of vision, produce some degree of B., whether they are on or in its substance. In general, these are irremediable; but if there is a spot, an artificial pupil may be made. Some years ago, Mr. Bowman, of London, met with a case in which the opacity consisted of a layer of phosphate and carbonate of lime: he removed it, and restored the vision, which had been totally lost for several years.

Night B. is a rare condition, in which a person finds, towards evening, that objects are becoming less and less distinct, and at last that he is totally blind. This may occur without previous warning, and cause great alarm, but next morning he finds that his sight is restored. This is repeated every night, but at last the eyes become weak during the day also, and may finally become amaurotic. This strange affection may be epidemic; it has attacked bodies of troops exposed to great fatigue and the glare of the sun's rays. If there are no symptoms of disease within the brain, recovery generally results from protecting the eyes from the light, entire repose, such remedies as correct any constitutional defect in the individual attacked, and repeated blistering.

Day B. is characterized by inability to see in a bright light; the subjects of it see more than usually well at night, but during the day have to be led about. Captives who have been long immured in dark cells are often affected with it, as a galley-slave mentioned by Larrey, who had for 33 years been shut up in a subterraneous dungeon, and when liberated could only see by night.

The structural causes of B. will be better understood when the eye (q.v.) is described, when it will be seen that advances in our knowledge of its anatomy have enabled surgeons to restore sight in cases which, some years ago, would have been considered hopeless; but it can never be too strongly impressed, especially on the young, that overwork wears out the eyes, whatever be the pursuit, and that, without being wholly dark, a

degree of blindness may be induced, such as to render the eyes useless for practical purposes. This condition, asthenopia or weak sight, is frequently met with in young lads with sedentary occupations, students, dressmakers; and, says Dr. Mackenzie of Glasgow, "what may be called the hothouse education of modern times is a fruitful source of it." The only cure is avoiding the evident causes.

BLINDNESS, COLOR. See COLOR BLINDNESS.

BLINDSTORY, another name for the *triforium* (q.v.), the second or middle arcade in the wall which separates the body from the aisles of a church. It is so called obviously as opposed to the *clearstory* or *clerestory* (q.v.), the third and uppermost arcade, the apertures of which admitted light into the church, while the apertures of the trifolium were dark—*obscuræ fenestræ*, as they are termed by Gervase of Canterbury. The B. which is most common in cathedral, conventual, and collegiate churches, served to give access to the various parts of the building, and to suspend tapestry and banners on high holidays. Viewed æsthetically, the gloom of the B. contrasts well with the luster of the clerestory.

BLINDWORM, *Anguis fragilis*, a small reptile, which, although it has commonly been ranked among serpents by naturalists, in consequence of agreement in general form, exhibits remarkable points of difference from the true serpents, and constitutes one of an interesting series of links by which they are connected with lizards. Mr. Gray has therefore recently united this, and other nearly allied genera, with the scink and seps family of saurian reptiles under the name of *saurophidia* (lizard-serpents), amongst which the gradation from the lizard to the serpent structure is marked by the more and more complete disappearance of limbs, and the increasing elongation of the body. In the genus *anguis* there is no trace of limbs externally, but the bones of the shoulder, the sternum or breast-bone, and the pelvis still exist in a rudimentary condition: the bones of the head, also, connect it with lizards, and do not admit of that dilatation of the gape which characterizes true serpents. The common B. is the only species of this genus known in Britain. It is found also in almost all parts of Europe. In some districts of Britain it is plentiful; in others, it is very rare or even unknown. It is a perfectly inoffensive creature, although it has very generally been persecuted by the ignorant as extremely venomous. Its teeth are so small that even when it attempts to bite, which it only does upon much irritation, it cannot pierce the skin. No species of the group to which it belongs has poison-fangs. It is very timid, and, when alarmed, contracts itself forcibly, and then becomes remarkably brittle, so as to be easily broken in two by a blow or by an attempt to bend it. This character of fragility is found also in other animals of this group. The name B. has apparently originated in a mistake caused by the smallness of the eyes, which, however, are very quick and brilliant. Another common name *slow-worm*, is more accurately characteristic. The length varies from 11 to 15 in., and sometimes even exceeds this; the thickness is almost equal throughout, the tail is blunt at the end; the scales are small, and nearly equal; the tongue is notched at the extremity, but not bifid as in snakes; the color is generally silvery gray, a dark line runs along the back, and frequently rows of dark spots along the sides. The food of the B. consists of slugs and insects. It retires in autumn under masses of decayed wood and leaves, or into soft dry soil. It changes its skin. It is viviparous (ovoviviparous), the number of young varying from 7 to 12 or 13 at a birth. The name B. is sometimes given to *cæcilia* (q.v.).

BLISTERED or **BLISTER STEEL.** This is the kind of steel from which, by hammering, rolling, etc., certain qualities of tools and files are fashioned. When broken up, piled, and welded under the hammer, it forms *shear steel* (see IRON), from which a finer class of tools is made, and when melted in crucibles it forms the finest kind of *cast steel* (q.v.) for cutlery. Blister steel is made from bar iron of superior quality by a process of *cementation;* and the furnace employed for the purpose is termed a converting furnace. It consists of two fire-brick rectangular chests or troughs, each being 16 ft. long and 3 ft. deep by 3 ft. wide, as a maximum size, placed alongside each other in an arched chamber, and surmounted by a wide conical chimney. One long fireplace, with a suitable arrangement of flues, heats both chests. Into each chest the iron bars are laid embedded in charcoal, about half an inch of which intervenes between each layer of iron bars. The whole is then plastered over with clay or grindstone-dust, and kept at a glowing red heat from 7 to 10 days, according to the purpose for which the blister steel is intended. When the bars are removed after cooling, they are found to have undergone a remarkable change. They are no longer tough, but quite brittle and fusible, and covered over with blisters. During the process, the iron absorbs and combines with from a half to one and a half per cent of carbon. The blisters are supposed to be due to the evolution of carbonic oxide arising from the combination of carbon with a trace of oxygen existing in the iron.

BLISTERING FLIES. See CANTHARIDES.

BLISTERS are medicinal agents which, when applied to the skin, raise the cuticle into small vesicles filled with serous fluid. They are applied either in the form of plasters or in a fluid state, as suits the convenience of the person or part, and have for their object the establishing of a counter-irritation or diversion of inflammatory action from

a part in which it cannot be reached by remedies, or from some organ where it may do permanent mischief, to some more superficial part of the body.

The most common blister in use is made of cantharides (q.v.) or Spanish fly (*cantharis vesicatoria*). Cantharides, mixed with a convenient proportion of lard and wax, form the blistering ointment of ordinary use; the only objection to this preparation being, that if applied too long it produces distressing affections of the urinary bladder. In young children and very thin-skinned persons, a layer of silver paper, or thin gauze wet with vinegar, may be laid between the blister and the skin. But under no circumstances should a blister be left long upon children, as it may produce sores which are apt to take on an unhealthy action, and are difficult to heal.

Mustard (*sinapis nigra*) is frequently used, but seldom left on sufficiently long to produce blistering. Tincture of cantharides, croton oil, and strong liquor ammoniæ, tartar emetic ointment, and many others, are used in practice.

If the occasion for the blister passes off, the vesicles should be pricked, and their fluid contents allowed to trickle away, the vesicated surface being then dressed with some cold cream or lard. But if it should appear desirable to promote a discharge from the skin, the raised cuticles may be snipped off, and the blister either applied again at intervals, or some stimulating ointment as the savine (*juniperus sabina*) made use of. Great cleanliness should be observed in dressing the part.

Of late years, B. have been much used for the dispersion of glandular tumors, and are also applied over the surfaces of indolent ulcers, with the view of increasing the vascularity of the part. For old diseases of joints, B. ought to be placed at a little distance from the affected joint.

BLOCH, MARCUS ELIESER, a celebrated ichthyologist, b. of poor Jewish parents, at Anspach, in Bavaria, 1723. He was allowed to grow up in extreme ignorance. At 19, he had read nothing except a few useless rabbinical treatises. About that age, however, he became assistant to a Jewish surgeon at Hamburg, where he took the opportunity of learning German and Latin. A slight knowledge which he had acquired of anatomy inspired him with an extraordinary desire to study that science thoroughly. For this purpose he went to Berlin, and devoted himself to it and other branches of natural history with indefatigable zeal. He took the degree of doctor of medicine at Frankfort-on-the-Oder; and returned to Berlin to practice his profession, where he died 6th Aug., 1799. His great work is the *Allgemeine Naturgeschichte der Fische* (12 vols., Berlin, 1782–95, with 432 colored plates), long the most comprehensive work on ichthyology, and still valuable especially for its pictures. His *Systema ichthyologiæ iconibus CX illustratum*, which was left in an unfinished state, was published by Schneider (Berlin, 1801). After his death, his collection of fishes was purchased by government, and forms a part of the Berlin zoological museum.

BLOCK, in the rigging of a ship, is an important part of the apparatus necessary for raising sails and yards, tightening ropes, etc. The B. comprises both the frame or shell, and the pulley or pulleys contained within it. In seamen's language, a *tackle* includes the rope as well as the B. through which it works. The uses of blocks are very numerous on shipboard; and to subserve these uses, they are distributed about the masts, yards, sails, and ropes. They vary greatly in size, shape, power, and designation; but nearly every B. comprises a *shell* or wooden exterior, a *sheave* or wheel on which the rope runs, a *pin* or *axle* on which the sheave turns, and a *strap* (of rope or iron) to fasten the B. to any particular station (see PULLEY). A single B. contains only one sheave; a double B., two; and so on. Besides the designations of blocks according to the number of sheaves they contain (*single, double, treble, fourfold*), ships' blocks receive numerous other names—such as *bee-B., cut-B., cheek-B., clew-garnet B., clew-line B.*, etc. Some of these names depend on the kind of service, others on the place of fixing; while the rest are examples of the odd nomenclature adopted by seamen.

Block-making.—Ships' blocks were made by hand until about a century ago. But mere workers in wood could not produce them; it required unusual skill and practice to fashion the several pieces, and put them together so as to possess the requisite strength and facility in working. The trade was either carried on alone, or in conjunction with mast-making. More than 1400 such blocks were required for one of the old 74's, and a proportionate number of vessels for larger or smaller size. In 1781, a Mr. Taylor began to make the sheaves and shells of blocks by a process which he had invented. He made all the blocks for the royal navy until the expiration of his patent rights. The admiralty then commenced the manufacture on their own account. In 1801, Mr. (afterwards Sir) Mark Isambard Brunel submitted to the admiralty a working-model of a very beautiful system of machinery for block-making; it was accepted, and the inventor engaged to set up the apparatus at Portsmouth. So intricate was the machinery, and so great the difficulty in procuring the several working-parts from the machinists of those days, that it was not until the year 1808 that the system was put into effective operation. It was then, however, so perfect that very few additions or improvements have since been needed. The machinery made blocks more accurately than they had ever been made by hand, and with the aid of ordinary workmen only. It could effect £50,000 worth of work in a year, or 140,000 blocks, by the assistance of 10 men attending the machine. Duplicate machinery was made for Chatham. Brunel received £20,000 for his invention

and for his personal superintendence until the machinery was brought into working-order; this sum was money well laid out, for the machine saved to the country more than £20,000 a year, in the busy warlike period from 1808 to 1815. The machinery itself is too complicated to be described except at a length incompatible with the limits of this work; but it may be stated in a general way, that the system is made up chiefly of saws and lathes, combined with great ingenuity. The blocks are made of elm, and the sheaves of lignum vitæ; the pins are of iron, carefully prepared to avoid friction as much as possible.

BLOCKADE, in military tactics, is an operation for capturing an enemy's town or fortress, without a bombardment or regular siege. The attacking party throws up works on the neighboring heights and roads; these works may be redoubts, for 200 or 300 men each, raised around at distances of 1000 or 1500 yards asunder; or they may assume other forms, according to the circumstances of each case. The rest of the besieging force remains under cover in villages, or in a temporary camp, ready to repel any sortie attempted by the besieged. The whole purpose in view is to prevent the besieged from receiving supplies of any kind, in order that, when the food or the ammunition is exhausted, they may be compelled to surrender. Fortresses situated on steep and rocky eminences, difficult to conquer by bombardment or assault, may often be reduced by B.; because the roads or paths for the reception of supplies are few, and can be watched by a small number of troops. Towns situated on a plain are less frequently invested. If the inhabitants be numerous and commercial, they will soon be impatient of the restraint produced by a B., and may compel or induce the governor to adopt a plan opposed to his wishes as a soldier. If, however, a resistance be determined on, the governor sends out of the town as many non-combatants as possible; all the stores are collected in bomb-proof receptacles; economy is observed in the consumption of food; all the people within the walls are placed under military rules; and the governor endeavors, by frequent sorties, to prevent the besiegers from making too close an investment of the place.

Blockading, in a naval sense, is the prevention of the entrance or exit of the enemy's ships at a particular port. It is sometimes resorted to as an auxiliary to military operations by land; but generally is limited to a maritime investment.

BLOCK, Moritz, b. 1816; a German political economist, naturalized in France. After service in the statistical work of the ministry of agriculture, commerce, and public works, he devoted himself to authorship and published works on agriculture in various countries of Europe, on French statistics and finances, on socialism in Germany, and began and continued for some years the *Annuaire de l'Administration Française*.

BLOCKADE, in international law, is the right, in time of war, of rendering intercourse with an enemy's port unlawful on the part of neutrals; and it is carried into effect by an armed force (ships of war), which blocks up and bars export or import to or from the place blockaded. This right is described by all writers on the law of nations as clear and incontrovertible, having its origin in the soundest principles of maritime jurisprudence, sanctioned by the practice of the best times. It is explained on the reasonable theory, that if a potentate or government lays siege to a place, or simply blockades it, such potentate or government has a right to prevent any other power, or representative or subject of such power, from entering, and to treat as an enemy any one who attempts to enter the blockaded place, or in any way assists the besieged, for such a person opposes the undertaking, and contributes to the miscarriage of it.

Lord Stowell laid it down that there are two sorts of B.—one by the simple fact only, the other by a notification accompanied with the fact. In the former case, when the fact ceases—otherwise than by accident or the shifting of the wind—there is immediately an end of the B.; but where the fact is accompanied by a public notification from the government of a belligerent country to neutral governments, the B. must be supposed to exist till it has been publicly repealed. This notification it is the duty of the belligerent country to make immediately. His lordship also explained that, on the question of B., three things must be proved: 1st, The existence of an actual B.; 2d, The knowledge of the party; and 3d, Some act of violation, either by going in or coming out with a cargo laden after the commencement of blockade. On this last point, the time of shipment is very material; for although it might be hard to refuse a neutral liberty to retire with a cargo already laden, and by that act already become neutral property, yet, after the commencement of a B., a neutral cannot be allowed to interfere in any way to assist the exportation of the property of the enemy. After the commencement of a B., a neutral is no longer at liberty to make any purchase in that port. But the most essential element is *actual* B., and this state of things can only be proved to the satisfaction of a court of justice by the ships stationed on the spot to maintain the B. using their force for that purpose. A B., therefore, is only to be considered as actually existing when there is a power to enforce it.

To be valid, a B. must be accompanied by actual investment of the place, and it may be more or less rigorous, either for the purpose of watching the operations of the enemy, or, on a more extended scale, to cut off all access of neutral vessels to that interdicted place, which is strictly and properly a B.; for the former is, in truth, no B. at all, as far as neutrals are concerned. But to be binding on neutrals, it ought to be shown that

they have knowledge or may be presumed to know of the B.; and this knowledge may arise in two ways—either by such a public and formal notification as we have already described, or by the notoriety of the fact. Yet it is at all times most convenient that the B. should be declared in a public and distinct manner, instead of being left to creep out from the consequences produced by it; and the effect of such notification to the neutral government is clearly to include all the individuals subject to the latter.

The breach of B. may be either by coming out of the blockaded port, or going in; such breach, however, may sometimes be excusable. It has been decided that intoxication on the part of the master of a ship will not be received as an excuse. That breach of B. subjects the property employed for that purpose to confiscation is an established rule of the law of nations, and is universally acknowledged by all civilized governments. The violation of B. by the master, however, affects the ship, but not the cargo, unless the cargo is the property of the same owner, or unless the owner of the cargo is cognizant of the intended violation.

On the proclamation of peace, or from any political or belligerent cause, the continuance of the investment may cease to be necessary, and the B. is then said to be *raised*. The blockading force then retires, and the port is open as before to all other nations.—See the law on the subject of this article extremely well stated in *A Manual of the Law of Maritime Warfare*, by William Hazlitt and Henry Philip Roche, barristers-at-law, 1854; see, also, ORDERS IN COUNCIL, BRITISH.

BLOCK BOOKS. See PRINTING, *ante*.

BLOCKHOUSE is to a temporary fortification what a tower is to one that is permanent. In a wooded country, it is easily and quickly made, and the enemy cannot readily bring guns to bear upon it; on flat open ground it is less useful. The B. is always a covered defense, unlike a battery; sometimes with only one story, sometimes with two, of which the lower forms a barrack for a few men. It is usually either rectangular or shaped like a Greek cross; the latter is preferred, as enabling the fronts of fire to flank each other. The defense is usually by musketry. If opposed to infantry only, single rows of trunks of trees, either upright or horizontal, make a very good B., loopholed at intervals of about 3 ft.; and if there be earth enough quickly obtainable, by digging a ditch or from any other source, to embank it all round and to cover the roof, it will bear a great deal of rough usage. If opposed to artillery, the B. requires to be formed with double rows of trunks three feet apart, with well-rammed earth between them. The American backwoodsmen build blockhouses with great quickness and efficiency; several of these, with a curtain or continuous wall of stockading, may be made to inclose a large space, capable of accommodating a great number of defenders, and of repelling a considerable hostile force. The base of a wind-mill, on a hill, has in European countries often formed a good blockhouse. A regular B. should have a ditch, not only to supply earth, but to keep the enemy from approaching near enough to fire the timber of the blockhouse. There must be, at least, 4 ft. of well-rammed earth on the roof, to resist the effect of artillery. Such a structure without a roof is not a B., it is simply a stockade.

BLOCK ISLAND, in the Atlantic, s. of Rhode Island, and n.e. of Long Island; about 8 m. long and 5 wide, constituting the town of New Shoreham, Newport co., R. I.; pop. '70, 1113. It attracts numerous summer visitors. There is a light-house on the n.w. extremity in 41° 13′ n. and 71° 34′ west.

BLOCK-PRINTING. See PRINTING.

BLOCKSBERG, the name given to various mountains and hills in Germany, but pre-eminently to the Brocken, the highest point of the Harz mountains, and, indeed, of the n. of Germany. According to the popular belief, it is the favorite haunt of the witches, where they celebrate the night of the 1st of May, *Walpurgisnacht* (see WALPURGA), with wild orgies. Almost all mountains thus haunted are known to have been famous places of sacrifice in the ages of paganism.

BLOCK-SHIP, is a ship of war too old or too slow in sailing to render efficient service in action out at sea, but useful as a defense in great ports and naval arsenals. Since war-steamers have almost superseded the old sailing men-of-war, the latter are of little service except as block-ships, or for training-ships. The number of block-ships in the British navy in 1859 was about ten.

BLOCK-SYSTEM. See *Signals*, under RAILWAYS.

BLOCK-TIN is an inferior variety of tin. When the metal is reduced from its ores, it is first poured into molds, and the ingots thus procured are heated to incipient fusion in a reverberatory furnace, when the pure tin first fuses, and is withdrawn; and the less pure tin which is left behind being melted at a higher temperature, is poured into molds and is known as block tin. See TIN.

BLODGET, LORIN, b. N. Y., 1823; student in physical sciences, and in 1851 an assistant in the Smithsonian institution, having charge of matters relating to climate and atmosphere. He shared in organizing the Pacific railroad surveys, and compiled in a volume the records of scientific observations at government military posts. In 1857, he issued *Climatology of the United States, and of the Temperate Latitudes of the North*

American Continent, a work highly praised by Humboldt. In 1863, he had charge of the statistical work of the treasury department, and has since been connected with the customs as appraiser at large.

BLODGET, SAMUEL, 1720–1807, an inventor, b. Mass. Under the colonial government he was judge of common pleas in New Hampshire. In 1783 he made machinery by which he saved a valuable cargo from a sunken vessel. His success prompted him to go to England, where he proposed to raise the *Royal George*, the British man-of-war that suddenly careened and sank off Spithead Aug. 29, 1782, Admiral Kempenfeldt and 600 other persons being lost. His proposition was not entertained, and he returned and began the manufacture of duck. In 1793, he began a canal around Amoskeag falls, but failed, and was imprisoned for debt. He believed that by strict temperance and care about exposure to the atmosphere any one might live 100 years; but he died at 87.

BLOEMFONTEIN, a t. in s. Africa, the capital of Orange Free State, 600 m. n.e. of cape Natal; pop. 1200; inhabited chiefly by Boers. There is considerable trade with Cape Colony and the Transvaal republic.

BLOIS, a t. of France, capital of the department of Loire-et-Cher, has a remarkably fine situation on the acclivity of a hill, and is built chiefly on the right bank of the Loire, over which there is here a good stone bridge. It is about 35 m. s.w. of Orleans, on the railway between that place and Tours. The houses, in the upper part of the town especially, are mean and ill-built, and the streets are crooked and narrow, but they are kept clean by water from the public fountains, which are supplied by a splendid aqueduct supposed to have been constructed by the Romans. B. has a handsome cathedral; but its chief glory is its old castle, which has been the scene of many interesting historical events. Louis XII was born in it, and under its roof Charles, duc d'Alençon, and Margaret of Anjou, and Henri IV. and Margaret of Valois were married. Here also were sometimes held the courts of François I., Henri II., Charles IX., and Henri III. Here also the duc de Guise and his brother were murdered, by order of Henri III., on the 23d Dec., 1588. Isabella, queen of Charles VI, here found a retreat; it served as a prison for Mary de' Medici; Catharine de' Medici died within its walls; and Maria Louisa here held her court in 1814, after Paris had capitulated. B. is a place of great antiquity. Stephen, who usurped the crown of England on the death of Henry I., was the son of one of the counts of B., by Adela the daughter of William the conqueror. B. is an archbishop's see, has a tribunal of commerce, a communal college, a public library of 20,000 vols., a botanic garden, etc., and manufactures of porcelain and gloves, with a trade in brandy, wine, and wood. Pop. '76, 18,188.

BLOMFIELD, CHARLES JAMES, bishop of London, a learned and influential prelate of the church of England, was b. in 1786, at Bury St. Edmund's, in Suffolk, where his father was schoolmaster. Being well grounded by his father in the classics, B. went to Cambridge, where he took high honors. After he had filled several curacies, the bishop of London appointed him his chaplain, in recognition of his acknowledged philological and theological acquirements. Shortly after, he was called to the living of St. Botolph; in 1824, he was made bishop of Chester; and in 1828, he was promoted to the see of London, on the translation of bishop Howley to Canterbury. B.'s reputation for classical scholarship rests chiefly on his editions of *Callimachus* (Lond. 1815), and of several of the dramas of *Eschylus*. In connection with Rennel, he published the *Musæ Cantabrigienses;* and with Monk (1812), the *Posthumous Tracts of Porson;* and in 1814, the *Adversaria Porsoni*. He also published *Lectures on the Acts of the Apostles*. B. was exceedingly active in the superintendence of his diocese, and was a prime mover in the agitation for the erection of new churches. Under his presidency, more churches were erected in London than under any bishop since the reformation. His conduct in regard to the controversies that latterly agitated his diocese was much animadverted by both parties. He was accused at one time of leaning to Puseyism, and yet he proceeded against his clergy for alleged crypto-catholic practices. He died Aug., 1857.

BLOMMAERT, PHILIP, one of the most prominent of modern Flemish authors, was b. in 1809. In 1834, he published a volume of verse, characterized by much simplicity and earnestness, but so inartistic in form that it met with little success. He rendered better service to literature and to the patriotic cause by the publication (1836–41) of *Theophilus*, an old Flemish poem of the 14th c., and of the *Oudvlaemsche Gedichten* (old Flemish poems) of the 12th, 13th, and 14th centuries. Both works are enriched with glossaries and learned annotations. B. showed a predilection for middle-age literature generally, and translated the *Nibelungen* into Flemish iambics. His most important work is a history of the Belgians (Brussels, 1849), in which he attempts to show that the political destiny of the low countries has ever been identical with that of Germany, and that it is with the latter country, and not with France, she should seek to ally herself. B. also contributed extensively to several Belgian journals, especially to the *Messager des Sciences Historiques*. He died at Ghent, Aug. 14, 1871.

BLOND, JACQUES CHRISTOPHE LE, 1670–1741: a painter of Amsterdam, noted for miniature portraits. He conceived the idea of printing engravings in colors, and spent the most of his life in unsuccessful experiments, working in London and Paris, and

dying in a hospital in the latter city. Notwithstanding this ill-success, B. is regarded as the inventor of color-printing.

BLONDEL, a celebrated French minstrel of the 12th c., and the favorite of Richard the Lion-heart, king of England, whom he accompanied to Palestine. When Richard, on his return, was seized and imprisoned by Leopold, duke of Austria, B. (according to the exquisitely romantic myth of an old chronicler) resolved to find out the place in which his master was confined. He wandered through Germany in disguise, and at length coming to the castle of Löwenstein, in Austria, he heard that it contained some illustrious captive. Feeling assured that this was no other than the king, he tried all means to get a sight of him, but to no purpose. He then placed himself opposite to the tower in which he learned the unknown was imprisoned, and commenced singing one of those Provençal songs which Richard and he had composed together. Hardly had B. finished the first stanza, when a well-known voice from the tower took up the second, and carried it on to the end. So the minstrel discovered his monarch, and returning with all speed to England, was the means of his being ransomed by his subjects. Only a few of B.'s poems have come down to us; they are preserved in the Library of the Arsenal at Paris.

BLOOD, the nutritive fluid of the tissues, consists of a transparent colorless fluid, the *liquor sanguinis*, and minute solid bodies, the "corpuscles" which float in it. The liquor sanguinis consists of water, in which are dissolved fibrine, albumen, chlorides of sodium and potassium, phosphates of soda, lime, and magnesia, together with fatty and extractive matters, the latter the product of the metamorphosis of the tissues. The corpuscles are of two kinds—white and red; the white are larger and less numerous than the red, being in healthy blood in the proportion of 2 or 3 to 1000. In certain forms of disease the number of these white blood-corpuscles is increased. They present a granular appearance on the surface, have a nucleoleus, which is speedily brought into view by the action of dilute acetic acid, and are identical with the lymph-corpuscle. Under the microscope they vary their forms in the same way as the Amœba (see PROTEUS); hence these movements are called *amœboid*. The *red* corpuscles are peculiar to vertebrates, and seem to have their origin in the white corpuscles, are oval and nucleated in fishes, reptiles, and birds, but in man and the mammalia generally they are non-nucleated, and are biconcave flattened discs, their edges being thicker than the center, hence the dark appearance of the latter when seen under the microscope. They have a great tendency to turn on their side and run into rouleaux, like piles of coins. Their color is straw-yellow, and it is only when seen *en masse* that they give the blood its characteristic red color. The size of the human red blood-corpuscles is $\frac{1}{3200}$ of an inch. They are largest in reptiles, those of the Proteus (q.v.) being $\frac{1}{1000}$ of an inch in their long diameter. Hoppe Seyler has shown that, chemically, they consist chiefly of hemoglobin, with traces of albumen, cholestrin, protagen, phosphate of potash, but no fat. The specific gravity of B. is 1052 to 1057, and its *mean* quantity in an adult man about 34½ lbs. On evaporation as a whole, the B. yields 790 parts in 1000 of water, and 210 of solid residue, which residue has nearly the same ultimate chemical composition as that of flesh. When B. is set aside for a time, occasionally crystals consisting of globulin tinted with coloring matter appear. "The B. crystals of man and the carnivora have a prismatic form, whilst those of the rat and mouse are tetrahedral, and those of the squirrel hexagonal" (Carpenter).

Coagulation of the Blood.—When B. is drawn from the vessels, the liquor sanguinis separates into two parts—into fibrine, which becomes solid, and a pale yellowish colored liquid, *serum*. The fibrine coagulates, and in doing so entangles the corpuscles, and forms a red mass, the clot (*crassamentum*). Fibrine does not exist in the B. as such, but when it appears as a coagulum in the fluid, it is produced then and there by the union of two substances present in the blood, which separate as a solid matter (Schmidt)—the one, *globulin*, is contained in the blood-corpuscles; the other, *fibrinogen*, in the blood-plasma, the two uniting to form the fiber of the clot. The rapidity with which this change takes place varies with circumstances. Moderate heat, and exposure to the air, favor it; cold and exclusion from the air retard it. The B. remains fluid in the veins for some time after death. In glanders and some forms of malignant fever, and where the B. is *poor*, as in scurvy, it may remain fluid. The size and firmness of the clot depends on the amount of fibrine in the B., which in health averages about 2 parts in 1000. In inflammations it is much increased, and the B. forms slowly into a tough clot, which is almost destitute of red globules on its surface, and drawn in towards the center. This colorless layer is termed the *buffy coat*, and the physicians of bygone times used to attach great importance to it, believing that it was a phenomenon peculiar to inflammation, and bled repeatedly, with the view to its removal; whereas anything which delays coagulation, great poverty of B., as in chlorosis (q.v.), or any condition in which the fibrine is in greater proportion than the red blood globules, will cause this appearance; the clot of the impoverished blood will, however, be small and loose, and floating in an excessive quantity of serum. The color of the B. varies. In the arteries it is of a bright-scarlet color, while in the veins it is of a dark-purple color. The chief difference between arterial and venous blood is that the former contains more oxygen and less carbonic acid than the latter. See CIRCULATION OF THE BLOOD. This change

probably arises from the oxygen contracting the corpuscles, and altering their reflecting surfaces; carbonic acid, on the other hand, rendering them thinner and more flaccid. The changes in color can be effected in B. drawn out of the body by the application of the gases mentioned.

The red blood-corpuscles possess great powers of absorbing oxygen. They receive oxygen in the lungs, where they become colored, and carry it all over the body to the tissues to form new combinations. After a time, the corpuscles become dissolved in the liquor sanguinis, which fluid they serve to elaborate. The products of the metamorphosis of the tissues are poured into the B., so that it is really a very complex fluid. See RESPIRATION.

BLOOD, AVENGER OF. In the early ages of society, the infliction of the penalty of death for murder did not take place by the action of any tribunal or public authorities administering law, but, in accordance with the rude social condition, was left to the nearest relative of the murdered, whose recognized duty was to pursue and slay the murderer. He was called the avenger of B., in Hebrew, *Goël*, which term, however, was of much wider signification. The Mosaic law (Numb. xxxv.) did not set aside this universal institution of primitive society, but placed it under regulations, prohibiting the commutation of the penalty of death for money, which appears to have become frequent, and appointing *cities of refuge* for the manslayer who was not really a murderer. See CITY OF REFUGE. The Koran sanctions the avenging of B. by the nearest kinsman, but also sanctions the pecuniary commutation for murder. The primitive institution or custom subsists in full force among the Arabs at this day. Many of the hereditary feuds of families, clans, and tribes in all barbarous and semi-barbarous countries, have always been connected with the avenging of blood.

BLOOD, CORRUPTION OF (in law). See TREASON.

BLOOD, EATING OF. The eating of B. was prohibited under the Old Testament dispensation, obviously for reasons connected with the use of animals in sacrifice. Christians, with a few exceptions, have always regarded the prohibition as having ceased with the reason for it; and the exhortation of the apostolic council of Jerusalem to the Gentile converts to abstain "from things strangled and from blood," to have been merely an application of the great law of Christian charity to the circumstances of a transition period, with reference to the prejudices of Jewish converts.

BLOOD, THOMAS, a most daring, unscrupulous, and successful adventurer, was b. in Ireland about 1628, and served there in the parliamentary army. After the restoration, he put himself at the head of an insurrectionary plot, which was to begin with the seizure of Dublin Castle, and of Ormond, the lord-lieutenant. On its timely discovery, he fled, while his chief accomplices were seized and executed. Escaping to Holland, he was received there with high consideration. He soon found his way back to England, to try what mischief might be brewed among the fifth-monarchy men. Finding no prospect of success, he repaired to Scotland, invited by the turbulent state of affairs, and was present at the fight of Pentland, Nov. 27, 1666. On the night of the 6th Dec., 1670, the duke of Ormond was seized, in his coach in St. James's street, by a gang of bravoes, tied on horseback behind one of them, and hurried away towards Tyburn. The timely approach of his attendants at the moment that he had succeeded in struggling with his riding-companion to the ground, probably saved him from hanging. The leader in this daring villainy was B., and so well had he contrived it, that he did not even incur suspicion. His next enterprise was still more wild and dangerous. On the 9th of May, 1671, disguised as a clergyman, and accompanied by his former accomplices, he entered the Tower with the determination to carry off the regalia of England. After nearly murdering the keeper of the jewels, he actually succeeded in carrying off the crown under his cloak, while one of his associates bore away the orb. They were immediately pursued, however, seized, and committed to the Tower jail. Now came a singular turn of fortune. At the instigation of Buckingham, who was accused of having hired B. to attack the duke of Ormond, king Charles visited the dauntless miscreant in prison, and, dreading the threat that there were hundreds of B.'s associates banded together by oath to avenge the death of any of the fraternity, pardoned him, took him to court, gave him an estate of £500 a year, and raised him so high in favor that for several years col. B. was an influential medium of royal patronage. This scandalous disregard of public decency was heightened by the fact, that the old jewel-keeper, who had risked his life in defense of his charge, applied in vain for payment of a small reward for his devotion. After the fall of the "cabal" ministry, B. became hostile to Buckingham, and for a scandalous charge against him was committed to prison. He was bailed out, and died in his own house in 1680.

BLOOD-BIRD of New South Wales, *Myzomela sanguinolenta*, a beautiful little species of honey-eater (q.v.), which receives its name from the rich scarlet color of the head, neck, breast, and back of the male. It inhabits thickets. A very similar species is found in Bengal.

BLOOD-FLOWER, *Hæmanthus*, a genus of bulbous-rooted plants, of the natural order *amaryllideæ* (q.v.), mostly natives of South Africa, some of which are among the prized

ornaments of British green houses. They take their name from the usual color of their flowers, which form a fine head or cluster, arising from a spathe of a number of leaves. The fruit is a berry, usually with three seeds. The leaves of the different species exhibit considerable diversity of form, in some almost linear, in others almost round; in some, also, they are erect, in others appressed to the ground. The bulbs of some of the finest species of B. being very slow to produce offshoots, a curious method of propagating them is resorted to by gardeners, which is occasionally practiced also with other bulbous-rooted plants, by cutting them across above the middle, upon which a number of young bulbs form around the outer edge.

The species of B. seem generally to possess poisonous properties. The inspissated juice of *H. toxicarius* is used by the natives of South Africa for poisoning their arrows.

BLOODHOUND, a variety of hound (q.v.) remarkable for its exquisite scent and for its great sagacity and perseverance in tracking any object to the pursuit of which it has been trained. It derives its name from its original common employment in the chase, either to track a wounded animal or to discover the lair of a beast of prey. It was also formerly called, both in England and Scotland, *sleut-hound* or *sleuth-hound*, from the Saxon *sleut*, the track of a deer. The B. was formerly common and much in use in Britain, as well as on the continent of Europe, but is now rare. The poetical histories of Bruce and Wallace describe these heroes as occasionally tracked by blood-hounds, when they were skulking from their enemies. The B. was at a later period much used to guide in the pursuit of cattle carried off in border raids; it has been frequently used for the pursuit of felons and of deer-stealers; and latterly, in America, for the capture of fugitive slaves, an employment of its powers which has contributed not a little to render its name odious to many philanthropists. Terrible ideas are also, probably, suggested by the name itself, although the B. is by no means a particularly ferocious kind of dog, and when employed in the pursuit of human beings, can be trained to detain them as prisoners without offering to injure them. The true B. is taller and also stronger in proportion and of more compact figure than a fox-hound, muscular and broad-chested, with large pendulous ears, large pendulous upper lips, and an expression of face which is variously described as "thoughtful," "noble," and "stern." The original color is said to have been a deep tan, clouded with black. The color appears to have been one of the chief distinctions between the B. and the talbot (q.v.), but it is not improbable that this name was originally common to all bloodhounds. Many interesting anecdotes are recorded of the perseverance and success of bloodhounds in following a track upon which they have been set, even when it has led them through much frequented roads.—The CUBAN B., which is much employed in the pursuit of felons and of fugitive slaves in Cuba, differs considerably from the true B. of Britain and of the continent of Europe, being more fierce and having more resemblance to the bull-dog, and probably a connection with that or some similar race. Many of these dogs were imported into Jamaica in 1796, to be employed in suppressing the maroon (q.v.) insurrection, but the terror occasioned by their arrival produced this effect without their actual employment. It was this kind of B. which was chiefly introduced into the former slave-states of North America.

BLOOD-MONEY, the compensation by a man-slayer to the next of kin of the man slain, securing the offender and his relatives against subsequent retaliation. It was common in Scandinavian and Teutonic countries until after the introduction of Christianity, and the amounts were fixed by law. It is still a custom among the Arabs. There it costs only one third as much to kill a woman as to kill a man; but if a woman slain be quick with a male child, the fine is that for a full man; if with a female child, it is the price of two women. The amount of blood-money ranges from $150 to ten times that amount. The term blood-money was given in English law to rewards earned by informers against notorious offenders; and it is still used there and in America for compensation obtained by criminals who betray their fellows in crime, or more generally for the reward gained by any act of treachery.

BLOOD OF OUR SAVIOR, was an order of knighthood in Mantua, instituted by duke Vincent Gonçaga in 1608, on the occasion of the marriage of his son with a daughter of the duke of Savoy. It consisted of 20 knights, the Mantuan dukes being sovereigns. The collar had threads of gold laid on fire, and interwoven with the words *Domine probasti*. To the collar were pendent two angels, supporting three drops of blood, and circumscribed with the motto *Nihil isto triste recepto*. The name originated in the belief that in St. Andrew's church, in Mantua, certain drops of our Savior's blood are kept as a relic.

BLOOD OF SAINT JANUARIUS. See JANUARIUS, SAINT.

BLOOD RAIN. Showers of reddish and grayish dust sometimes fall on vessels off the coast of Africa, and on the land in the s. of Europe; if accompanied with moisture, they form "blood rain," and in elevated regions, red snow. The dust consists chiefly of microscopic organisms, while the red color comes from oxide of iron. A shower which fell at Lyons, Oct. 17, 1846, was estimated to bring 720,000 lbs. of matter, of which one eighth was organic. A shower described by Darwin covered more than 1,000,000 sq. miles. A shower in Italy, in 1803, furnished 49 species of organisms; one

in 1813, in Calabria, 64 species, of which 28 were common to the preceding. These phenomena date back even to the time of Homer. The organic particles are mostly diatoms and rhizopods; the whole number of species determined is more than 300, of which 15 are South American, and none African.

The zone of the earth in which these showers occur extends on both sides of the Mediterranean westwardly over the Atlantic, and eastwardly to central Asia. The origin of the dust is not yet ascertained; there is little ground for thinking it extra-terrestrial, especially as the region affected is so limited.

BLOOD STAINS, as determined by modern science, have risen to importance in some criminal trials, where attempts have been made with some success to determine, by microscopic and chemical tests, whether the stains in question were made by the blood of a human being or of some other animal; and even the further question is proposed—was the stain made by the blood of a man, woman, or child? and if by that of a man, can we tell if it was the blood of one or of another man? With proper chemical solvents it seems easy to determine that a stain is or is not made from blood. If of blood, then the microscope indicates, by the measurements of the corpuscles of which the blood was composed, whether it was human blood. It is asserted as the result of careful examinations that the blood of a man has larger red corpuscles than that of any other animal. The mean diameter of these red corpuscles expressed in ten thousandths of an inch is thus stated: Man, 77; dog, 70; rabbit, 65; rat, 64; pig, 62; mouse, 61; ox, 58; horse, 57; cat, 56; sheep, 44. In fresh blood these measurements may, perhaps, be depended upon; but when the blood has been dried the corpuscles change their form, and it would probably be impossible to determine whether the stain were from human blood or not. As for determining the blood of one person from that of another, there does not seem to be any possibility of doing so; indeed, so far as experiment has gone, it appears that there may be more difference in the corpuscles of the same man's blood, taken at different times or from different parts, than between the corpuscles of the blood of different persons. The examination of stains has been a prominent feature in some recent trials for murder, but it does not appear that any considerable dependence has been placed upon the testimony of experts, partly because scientific testimony of such a nature is difficult to comprehend, and partly because experts themselves of equal attainments differ widely in their conclusions.

BLOOD-ROOT. See GEUM, HÆMODORACEÆ, and SANGUINARIA.

BLOODSTONE. See HELIOTROPE.

BLOOM, an appearance on paintings resembling in some measure the bloom on certain kinds of fruit, such as peaches, plums, etc. (hence the name), produced, in all probability, by the presence of moisture in the varnish, or on the surface of the painting when the varnish is laid on. The B. destroys the transparency, and is consequently very injurious to the general effect of a picture. It is best prevented by carefully drying the picture and heating the varnish before applying it; and best removed by a sponge dipped in hot camphene, after which a soft brush should be employed to smooth the surface of the picture, which should be finally placed in the sunshine to dry.

BLOOM'ARY, or BLO'MARY, a furnace for transforming pig-iron to wrought or malleable iron, or for making such iron directly from ore. When ore is used, a mass of iron called a "bloom" is produced, instead of the impure pig-iron that runs from the melted metal in a blast-furnace. The B. process is one of the oldest in iron-working, and is used in rude forms in some still barbarous countries. The best of modern bloomaries are the German and the Catalan (Spanish) furnaces, in which ores are reduced chiefly by means of charcoal. The best of ore should be used, as the waste is much greater in poor ore. In the Catalan the charcoal, with a large part of the iron, is heaped on a square hearth opposite to the tuyere, charcoal and fine ore being added from time to time, while a moderate blast is kept up and the mass occasionally stirred. In about six hours the iron settles to the bottom, is taken out in a mass, and forged into a bloom. For the German or more common bloom, the ore is pounded fine and thrown in small quantities upon a charcoal fire, with either hot or cold blast, hot being much the best. The metal settles to the bottom, and is drawn off at intervals, and hammered into "blooms." The process is available in places where wood (for charcoal) and good iron ore are found near each other. Iron so made is of the best quality, and is very desirable for converting into steel.

BLOOMERISM, a new and fanciful fashion of ladies' dress, partly resembling male attire, which arose out of what is termed the "woman's rights' movement," that began to be agitated in the United States about the year 1848. The first woman's rights' convention was held at Worcester, Mass., in 1850, under the presidency of Mrs. Lucretia Mott. Its object was to advocate for women a more liberal education, training in trades and professions, and generally the social and political privileges possessed by the other sex. At the same date, and in close connection with this movement, arose an agitation for the reform of female attire. Its advocates said, justly enough, that if women were to take their place in the world as fellow-workers with men, they ought not to labor under the disadvantage of having a dress that deprived them of the use of their hands, and required nearly their whole muscular power for its support. In 1849, Mrs. Ann

Bloomer adopted the costume to which she has given her name, and lectured in New York and elsewhere on its advantages. The Bloomer dress consisted of a jacket with close sleeves, a skirt falling a little below the knee, and a pair of Turkish trowsers. Though a few ladies followed the example of Mrs. Bloomer, the dress was extremely unpopular, and exposed its adherents to a degree of social martyrdom which the more prudent, timid, or amiable declined to brave. A very elegant modification of the Bloomer dress was achieved by a New York lady—a Polish jacket, trimmed with fur, and a skirt reaching to within a few inches of the ground, avoiding a display of pantaloon, and showing off merely the trim furred boot, but still sufficiently short to avoid contact with the street; the filthy habit of spitting, which prevails in America, rendering such avoidance peculiarly necessary. The agitation for dress-reform has not died out on the other side the Atlantic. There appeared in New York a monthly publication, called the *Sibyl*, devoted to its advocacy, and whose editor, a married lady, as well as several of her contributors, personally illustrated their principles. A wood-cut at the head of the periodical represented the reform dress, as it was called. It looked by no means tempting in point of elegance—a fault fatal to its general adoption. The skirt was immoderately short, and the jacket cut the figure awkwardly in two. The introduction of B. into England, soon after it had sprung up in America, was under such unfavorable auspices, that it failed to gain entrance into respectable society, and speedily disappeared. Still here, as in America, nothing is more frequently talked of, or desired with more apparent fervency, than a dress reform. For instance, the heavy hooped skirts prevalent some years ago, injurious to health, fatal to comfort, and liable to be equally dirty and ridiculous, were universally complained of; but the prejudice with which any innovation is sure to be met, long discouraged every attempt to introduce a reform.

BLOOMFIELD, a t. in Essex co., N. J., 4 m. n.n.w. of Newark, on the Morris canal, and the Newark, Bloomfield, and Montclair branch of the Delaware, Lackawanna, and Western railroad. It also has connection with Newark by horse-cars. Pop. about 6000. It is a manufacturing place, and the residence of many business men of New York and Newark. It was one of the earliest settlements in the state. The Presbyterian church has here a seminary for the education of German ministers. The town was named from gen. Joseph Bloomfield, a revolutionary officer, member of congress, and governor of New Jersey.

BLOOMFIELD, ROBERT, the author of *The Farmer's Boy*, and other pastoral pieces, b. 1766, at Honington, near Bury St. Edmund's, was the son of a poor tailor, who died leaving Robert an infant. His mother with difficulty subsisted by teaching a school, where B. learned to read. At the age of 11, he was hired to a farmer, but ultimately became a shoemaker in London, where he wrote his *Farmer's Boy* in a poor garret. It was published in 1800, had extraordinary popularity, and was translated into a number of languages. He subsequently published *Rural Tales, Wild Flowers*, and other pieces. Though efforts were made for him by persons of rank, his health broke down, and he died nearly insane, at Shefford, in Bedfordshire, in 1823.

BLOOMFIELD, SAMUEL THOMAS, D.D., 1790–1869; an English critic, educated at Cambridge, and rector at Bisbrooke, Rutland. He was the author of many critical, doctrinal, and exegetical annotations to the New Testament; translated Thucydides' *History of the Peloponnesian War;* and made English notes to the Greek edition of the New Testament, a work still widely used in England and America.

BLOOMINGTON, a thriving city of central Illinois, the co. seat of McLean co. It is an important railroad center, having connection with St. Louis, Chicago, and Jacksonville, by the Chicago and Alton; with Cairo and Dubuque by the Illinois Central; with Indianapolis and Peoria, by the Indianapolis, Bloomington and Western; and with Toledo, by a division of the Wabash railroad. Pop. '70, 14,190. Here are the large repair-shops of the Chicago and Alton road, employing 1000 men, foundries, furnaces, and coal-mines; and it is an important center of local and general trade. A court-house, lately built of Illinois marble, at a cost of $100,000, adorns a beautiful square in the heart of the city. It has well-organized public schools, a high-school, a Roman Catholic academy, the Major college for women, 2 daily and 5 weekly papers. Water works are supplied from a large well dug in the prairie. The Illinois Wesleyan university (Methodist Episcopal), founded here in 1853, had, in 1879, 10 professors and 180 students. Its president is W. H. H. Adams, D.D. At Normal, 2 m. n. of the city, at the junction of the Illinois Central and Chicago and Alton railroads, is the Northern Illinois normal university, also organized in 1857. It has an imposing edifice built at a cost of about $200,000; 14 professors and teachers; 435 students; with 235 pupils in the training schools. Its president is Edwin C. Hewett, LL.D., who succeeded Richard Edwards, LL.D., in 1875. Connected with this institution is the state laboratory of natural history, in charge of prof. S. A. Forbes.

BLOOMINGTON, the seat of justice of Monroe co., Ind., between the branches of White river, 60 m. s.s.w. of Indianapolis, on the Louisville, New Albany and Chicago railroad. Its people are engaged in manufactures, limestone quarrying, and farm productions. It is the seat of the Indiana university (q.v.), founded by the state in 1828.

BLOUNT, a co. in n. Alabama, on the upper waters of Black Warrior river; intersected by the South and North Alabama railroad; 900 sq.m.; pop. '70, 9945—682 colored.

The surface is mountainous, with large forests; productions agricultural. Co. seat, Blountsville.

BLOUNT, a co. in s.e. Tennessee, on the N. Carolina border, intersected by the Knoxville and Augusta railroad; bounded or intersected by the Tennessee, Holston, and Little rivers; 600 sq.m.; pop. '70, 14,237—1460 colored. It has a mountainous surface, and fertile soil, producing wheat, corn, oats, etc., and sorghum molasses. Iron ore, marble, and limestone are found. Co. seat, Marysville.

BLOUNT, WILLIAM, 1744–1800; a politician in North Carolina and Tennessee. He was one of the signers of the federal constitution, governor of the territory of Ohio, and one of the first U. S. senators from Tennessee. He was expelled from the senate on a charge of having conspired to surrender New Orleans to the English. He was afterwards chosen to the Tennessee senate, and made its presiding officer.

BLOUSE, a name borrowed from the French for that loose, sack-like over-garment which, as worn in England by wagoners and farm-laborers, is called a smock-frock. The English smock-frock is made of coarse and imperfectly bleached linen, and is ornamented, particularly on the breast and shoulders, with plaits and embroidery. In the s. of Scotland it is sometimes worn by butchers, and is then blue, as in Germany and France. In Germany, it is frequently tightened to the body by a belt, and is sometimes made of coarse woolen; but France is pre-eminently the country of blouses. There they are worn universally, not only by the country people, but also by the laboring-classes in towns, not excepting Paris; and so characteristic is this garment, that the French populace are often called the "blouses." The *white* B. is Sunday dress with the working-classes in France, and has also often served as a countersign among the leaders of sections in secret societies. A lighter and neater garment of the sort, usually made of fine but imperfectly bleached linen, and buttoning in front, which the English smock-frock and the original continental B. do not, is much worn by summer tourists.

BLOW-FLY, *Sarcophaga carnaria*, an insect of the order *diptera* (two-winged), (q.v.), and of the large family *muscides*, of which the common house-fly (q.v.), flesh-fly (q.v.), etc., are familiar examples. The blow-fly is very similar to these in its general appearance; its body is hairy, the expanse of its wings about one inch, the face silky and yellow, the thorax gray, with three black stripes, the abdomen of a shining blackish brown, which, in certain points of view, assumes a bluish tint, checkered with glittering yellowish spots. One of the distinguishing characters of the genus is, that the eyes are widely separate in both sexes. The species of this genus are not unfrequently ovoviviparous, the eggs being hatched within the body of the parent. The generic name (Gr. *sarx*, flesh; *phago*, to eat) is derived from the circumstance that the larvæ of most of the species feed upon the flesh either of dead or of living animals. The blow-fly is common in Britain on heaths, in gardens, etc., and its larvæ are to be found feeding upon meat, the carcasses of animals, sometimes upon living earthworms, and too frequently upon sheep, of which it is one of the most grievous pests, requiring the constant attention of the shepherd during most of the summer and autumn. Some districts are more infested with it than others; it is particularly troublesome in the fenny districts of England. Unless the maggots are removed, they eat into the skin, the sheep suffer great torment, and soon die. At first they may be removed by shaking them out of the wool, into which dry sand is then abundantly sprinkled; but if they are very numerous, a mercurial ointment or wash of corrosive sublimate is applied; and when the skin is much broken, the wool is clipped away, an ointment of tar and grease is used, and a cloth sewed over the part. Like many other insects, the blow-fly multiplies with excessive rapidity.

Another species of this genus, common in Britain, is *S. mortuorum*, so named from its frequenting burial-vaults and similar places. It is very similar to the blow-fly, but the abdomen is of a shining steel blue, and there is a reddish brown line down the forehead.

BLOWING-MACHINES. The earliest blowing-machine was, doubtless, some form of the common bellows, the idea of which is supposed to have been derived from the lungs. A very primitive form of this instrument is still in use in some eastern countries, consisting simply of the skin of some animal sewed into a rude bag with a valve and nozzle. The older forms of domestic bellows are all constructed on the same principle—viz., a chamber formed of two boards with flexible leather sides, having at one end a nozzle with a narrow mouth; and in the lower board, a valve of considerably larger area for the admission of air. When the bellows are distended by drawing the boards apart, air is sucked in by the valve, to replace the vacuum which would otherwise be formed; and then, when the boards are being closed, the valve, which only opens inwards, is shut by the compressed air; and the latter, having no other escape, is forced out at the nozzle.

The great fault of the common bellows is, that it gives a succession of puffs, and not a continuous blast. One remedy for this was to use two bellows, so that one was blowing while the other was filling; but it was afterwards found that the double-bellows secured a still more uniform blast. This machine is merely the common bellows with a third board of the same shape as the other two placed between them, so as to form two chambers instead of one. The middle board is fixed, and both it and the lower one

have valves placed in them opening inward. A weight on the lower board keeps the under chamber filled with air; and when this board is raised by a lever or otherwise, the air which it contains is forced into the upper chamber. The exit pipe is attached to the latter, and a weight is placed on the upper board sufficiently heavy to press the air out in a continuous stream, the continuity being maintained by the large quantity of air always present in the upper chamber, and the uniform pressure of the weight. Some times a spring is used instead of a weight to press out the air. Even with the double bellows, however, the constant refilling of the upper portion from the lower prevents the blast from being quite regular.

For such purposes as the supplying of a continuous stream of air to a flame for glass blowing or soldering, a very convenient form of apparatus has been constructed by Mr. P. Stevenson of Edinburgh. By means of the common bellows worked by a treadle, air is blown into the lower portion of a small cylinder containing a quantity of water, and having a diaphragm in the middle of the height, with a wide pipe reaching nearly to the bottom. When the apparatus is at rest, the water remains below the diaphragm; but when air is blown in, it gradually rises through the pipe. The water as it descends then presses out the air in a steady stream by the exit-pipe, as a valve prevents it returning to the bellows.

Bellows made entirely of wood except the nozzle, first made in Germany in the 16th c., are in use in some continental countries. They are usually of large size, and the contrivance consists in having two boxes, of which the sides of the upper inclose those of the lower, so that the former can move up and down on the latter without admitting air except by a valve, as in the common bellows, of which, in fact, they are only a modification.

The Chinese have a very simple form of bellows, which is not only interesting in itself, but also because its action is almost the same as the blowing-engine. It is merely a square chamber of wood, with a close-fitting piston, which, when drawn from the nozzle, opens the valves to admit air, and when pushed in the opposite direction, shuts these valves, and forces the air out by the nozzle.

For blowing a domestic fire in a chimney, the most effective contrivance is a metal screen to close the front of the aperture above the grate, so that the supply of air must all pass through the fire. This kind of blower, however, will only act when the fire is already producing as much heat as to cause a sensible draught up the chimney.

For smelting and refining furnaces, where a blast with a pressure of 3 or 4 lbs. per sq. in. is required, blowing engines of large size are usually employed. In our article IRON, this kind of engine is referred to, and a small figure of one given; but we shall here describe the blowing apparatus itself more in detail. A blowing-engine consists of a steam-engine, with the ordinary steam-cylinder at one end, and a blast-cylinder at the other end of the beam. Such, at least, is the construction preferred for the larger-sized engines; but sometimes a horizontal arrangement of the cylinders is adopted for those of smaller size. The blowing-cylinder is of cast iron, with an air-tight piston, which, as it ascends and descends with the motion of the engine, alternately inhales and expels the air at each end. To affect this, a series of valves are provided, and these are arranged as follows: Inlet valves are placed on the top of the cylinder, and also on three sides of the box, but on the fourth side of this box there are two outlet valves. These valves consist of numerous openings, against which leather flaps lie when they are shut. Valves of a similar nature are placed at the bottom of the cylinder. When the piston descends, it would create a vacuum in the upper portion of the cylinder, provided there were no openings in it; but the external air pressing on the inlet valves, opens them, and fills the space above the piston; at the same time, the outlet valves, which only open outwards, are tightly closed by the air pressing inwards from the pipe. Again, when the piston ascends, it compresses the air above it, and exactly reverses the action of the valves. The valves at the bottom of the cylinder work exactly in the same way, the inlet valves opening when the piston ascends, and shutting when it descends, thus compelling the inhaled air to pass into the pipe by the lower outlet valves. The air is conducted by the pipe into a receiver of large capacity, which serves to equalize the blast before it passes to the tuyeres.

A blast-engine at Shelton iron-works, of which the blowing cylinder is 8 ft. 4 in. in diameter, and has a 9-ft. stroke, working with 186 horse-power, and making 32 single strokes of the piston per minute, inhales 15,700 cubic feet of atmospheric air per minute; but this is compressed by the blowing-cylinder to a pressure of 3 lbs. per sq. in. above the atmosphere, which reduces the volume supplied by the cylinder to 13,088 cubic feet. Its volume, however, is largely increased again, when raised to the hot-blast temperature, before entering the furnace. Much valuable information respecting blowing-engines and blast apparatus will be found in Dr. Percy's large work on *Metallurgy*, vol. ii.

In the Catalan forges of Spain and the s. of France, there is a very ingenious water-blowing machine in use called a *Trompe;* but it can only be advantageously employed where a fall of a few yards of water is available. A strong wooden cistern, to act as a reservoir for the water; wooden pipes (generally two in number), through which it descends; and a wind-chest, to allow the air and water to separate, constitute the essential parts of the apparatus. It is put in operation by lifting the wedge with a lever; this

allows the water to rush down the pipe, and in doing so, it draws in air through sloping holes, called aspirators, at the throat of the pipe. A continuous current of water and air is thus supplied to the wind-chest, which is provided with an opening for the escape of the water, while the air passes out in a regular stream by the nozzle-pipe. The height from which the water falls determines the tension of the blast; but the height seldom exceeds 27 ft., which gives a pressure of from 1½ to 2 lbs. to the sq. inch. It is asserted that no other blowing-machine gives so equable a blast as the trompe, and it is the least costly of any; but it has the serious defect of supplying air more or less saturated with moisture. The theory of this singular machine has never been satisfactorily explained, although one or two able philosophers, who have specially studied the matter, incline to the belief that much of the air is carried down the pipe by becoming entangled in water. It is found that the separation of the air from the water is greatly promoted by allowing the falling current to impinge on a narrow platform.

The fan, or fanners (q.v.), as it is sometimes called, is another machine of great value for producing currents of air. It has long been in use as a winnowing-machine for agricultural purposes, and also for creating a blast to melt pig-iron in foundries. More recently, it has been employed instead of bellows in smithies, on account of its greater convenience and the steadier blast which it yields. A domestic bellows has even been introduced on the fan principle. The fan is also much used in the ventilation of buildings, ships, and mines. For the last, it is now considered preferable to the plan of furnace ventilation, especially where there are fiery seams of coal.

In its construction, the fan is like a wheel, having the arms tipped with vanes, instead of being joined by a rim. It is placed inside a chest—usually in an eccentric position—with openings on each side round the spindle for the admission of air. The motion is given by steam or other power; and as it revolves, the centrifugal action sucks in air at the center, draws it towards the tips of the vanes, and these impel it forward through the exit-pipe. Engineers differ as to the proportions which should be adopted for the fan, and as to the extent of spiral which the fan-case should have. For foundries and smithies where the pressure of the blast required is from 4 to 5 ozs. per square inch, the following have been found to suit very well in practice: the width of the vanes, as well as their length, made one fourth of the diameter of the fan; the inlet openings in the sides of the fan-chest, one half, and the degree of eccentricity, one tenth of this diameter. There is a segmental slide by which the opening into the delivery-pipe may be increased or diminished. For such purposes, fans vary from 3 to 6 feet in diameter, and they are entirely constructed of iron. Double fans have been introduced by Mr. Chaplin in England, and by M. Perrigault in France. In these, two simple fans are so disposed on one spindle that the blast produced by one passes in its compressed state through a tube to the other, which largely augments the working pressure. In Platt and Schiele's silent fan, the air enters by a central entrance at one side only, and is expelled from the case at the opposite side. The vanes are a peculiar shape, and describe what the inventor (Schiele) calls an anti-friction curve. It is said to be very efficient, and so also is another form of noiseless fan by Mr. George Lloyd, London.

For the use of the fan in ventilation, see that head. In some cases, fans are of large size; some also are of peculiar construction. Agricultural fans (see FANNERS) are not usually placed in an eccentric position in their cases, and only some kinds of ventilating fans are. One of the happiest applications of the fan has been to draw off and render harmless the fine steel dust in the operation of needle-grinding.

A modified form of the fan, called a *centrifugal disk*, patented by Mr. Rammell, was successfully employed by the Pneumatic Dispatch Company for the transmission of the mail-bags. An ingenious but simple ventilator is in use in the mines of the Harz for supplying fresh air. It consists of two long cylindrical vessels, one of which is so much smaller as, when inverted, to move up and down inside the other. The outer one is partly filled with water, and has a tube leading through the water down to the mine. The inner inverted cask, which has a valve opening inwards, is lifted and then pressed down, so forcing air through the tube.

The Messrs. Roots' blowing-machine is thus described: "A pair of horizontal shafts, geared together at both ends, traverse a case of the form of two semi-cylinders, separated by a rectangle equal in depth to the diameter of the semi-cylinders, and in width to the distance between the centers of the shafts. . . . These shafts carry a pair of solid arms, each having a section somewhat resembling a figure of eight, the action of which, as they revolve, takes the air in by an aperture at the bottom of the machine, and expels it with considerable pressure, if required, at the top."

For the purposes of ventilation, and also for expelling accumulations of hot air, dust, waste flyings, etc., in factories, a machine has been constructed by Mr. J. Howorth, Farnworth, Bolton, called a *revolving Archimedean screw-ventilator*. It consists of an Archimedean screw inclosed in a tube with proper means of lubrication. Its diameter is 30 in., and it is made to be set in motion by steam or other power, but it is also furnished with a hood, on the top of which there are curved vanes, which turn the screw by the action of the wind. Immediately beneath these, there is another series of lateral vanes for the escape of the hot air.

BLOW-PIPE, a small instrument used in the arts for soldering metals, and in analytical chemistry and mineralogy, for determining the nature of substances by the action

of an intense and continuous heat, its principle depending on the fact, that when a jet of air or oxygen is thrown into a flame, the rapidity of combustion is increased, while the effects are concentrated by diminishing the extent or space originally occupied by the flame.

The blow-pipe generally consists of a conical tube of metal, about 8 in. long, closed at the wider or lower end, but open at the narrow or upper end, which latter constitutes the mouthpiece, and is turned over to admit of the lips closing perfectly round it. Near the lower end, a small tube, fitted with a finely perforated nozzle, is inserted at right angles to the large tube, the space below being intended as a chamber for condensing the moisture of the breath. Through this nozzle, a fine current of air can be projected against the flame experimented with.

When a current of air from the blow-pipe is directed against a candle or gas-jet, the flame almost entirely loses its luminosity, owing to the perfect combustion of the gases evolved from the source of heat, and is projected in a lateral direction, as a long-pointed cone, consisting of three distinct parts. The first or central cone is of a dark-blue color, and there the combustion is complete from the excess of air thrown in from the small nozzle. The second cone, or that immediately surrounding the first, is somewhat luminous; and here the oxygen, being insufficient for the combustion of the carbon, any metallic oxide subjected to the action of this portion of the flame is deprived of its oxygen, and reduced to the condition of metal: for this reason the luminous cone is generally termed the *reducing flame* of the blow-pipe. Beyond the second cone, or where the flame comes freely in contact with the atmosphere, and abundance of oxygen is present to effect complete combustion of the gases, is a third, or pale yellow envelope, containing excess of atmospheric air at a very high temperature, so that a portion of metal, such as lead or copper, placed at this point, becomes rapidly converted into its oxide: this outer part of the flame is on this account called the *oxidizing flame* of the blow-pipe.

Substances under examination before the blow-pipe are generally supported either on wood-charcoal or platinum—the latter in the condition of wire or foil. In applying the blow-pipe test, the body to be examined is either heated alone, or along with some flux or fusible substance; in some cases, for the purpose of assisting in the reduction of metals from their ores and other compounds; in others, for the production of a transparent glassy bead, in which different colors can be readily observed. When heated alone, a loop of platinum wire, or a piece of charcoal, is generally employed as a support; the former when the color of the flame is to be regarded as the characteristic reaction, the latter when such effects as the oxidation or reduction of metallic substances are to be observed.

The following are exemplifications of the difference of color communicated to the flame by different substances: Salts of potash color, the flame *violet;* soda, *yellow;* lithia, *purplish red;* baryta, *yellowish green;* strontia, *carmine;* lime, *brick red;* compounds of phosphoric acid, boracic acid, and copper, *green.* The commonly occurring metallic oxides reducible by heating on charcoal alone in the inner flame of the blow-pipe are the oxides of zinc, silver, lead, copper, bismuth, and antimony; the principal ores not so reducible are the alkalies and alkaline earths, as also the oxides of iron, manganese, and chromium. The fluxes generally used in blow-pipe experiments are either carbonate of soda, borax (biborate of soda), or the ammonia-phosphate of soda, otherwise called *microcosmic salt* (q.v.). The carbonate of soda, when heated on platinum-wire in the oxidizing flame, forms with silica a *colorless glass;* with oxide of antimony, a *white bead,* etc. The following metals are reduced from their compounds when heated with carbonate of soda on charcoal in the inner flame of the blow-pipe, viz.: nickel, cobalt, iron, molybdenum, tungsten, copper, tin, silver, gold, and platinum. When compounds of zinc, lead, bismuth, arsenic, antimony, tellurium, and cadmium are similarly treated, these metals are also formed, but being volatile, they pass off in vapor at the high temperature to which they are exposed.

Borax, as a flux, is generally mixed with the substance under examination, and placed on platinum-wire. When thus heated in either of the flames, baryta, strontia, lime, magnesia, alumina, and silica, yield *colorless beads;* cobalt gives a *fine blue color;* copper, a *green;* etc. With microcosmic salt, the results obtained are generally similar to those with borax, and need not be specially mentioned, as the test is applied in the same way. The blow-pipe has been long used by goldsmiths and jewelers for soldering metals, and by glass-blowers in fusing and sealing glass-tubes, etc.; it has also been applied in qualitative analysis for many years, but more recently chemists (especially Plattner) have devoted their attention to its use, and have even employed it with great success in *quantitative* chemical analysis; the advantages being that only a very small quantity of material is required to operate upon, whilst the results may be obtained with great rapidity and considerable accuracy.

BLOW-PIPE AND ARROW, a kind of weapon much used by some of the Indian tribes of South America, both in war and for killing game. It consists of a long straight tube, in which a small poisoned arrow is placed, and forcibly expelled by the breath. The tube or blow-pipe, called *gravatána pocuna,* etc., is 8 by 12 ft. long, the bore not generally large enough to admit the little-finger. It is made of reed or of the stem of a small palm. Near Pará, it is in general very ingeniously and nicely made of two stems of a palm (*iriartea setigera,* see IRIARTEA) of different diameters, the one fitted into the other,

in order the better to secure its perfect straightness. A *sight* is affixed to it near the end. The arrows used in that district are 15 to 18 in. long, made of the spines of another palm, sharply pointed, notched so as to break off in the wound, and their points covered with *curari* (q.v.) poison. A little soft down of the silk-cotton tree (q.v.) is twisted round each arrow, so as exactly to fit the tube. In Peru, arrows of only 1½ to 2 in. long are used, and a different kind of poison seems to be employed. An accidental wound from one of these poisoned arrows not unfrequently proves fatal. In the hand of a practiced Indian, the blow-pipe and arrow is a very deadly weapon, and particularly when directed against birds sitting in the tops of high trees. As his weapon makes no noise, the hunter often empties his quiver before he gathers up the game, and does more execution than an English sportsman could with his double-barreled fowling-piece.

BLUBBER. See CETACEA, WHALE, and WHALE-FISHERY.

BLÜCHER, GEBHARD LEBERECHT VON, prince of Wahlstadt, field-marshal of Prussia, was b. at Rostock, in Mecklenburg-Schwerin, West Germany, 16th Dec., 1742. At the commencement of the seven years' war, he joined a regiment of Swedish hussars, and in his first action was taken prisoner by the Prussian hussars, whose col. persuaded him to exchange out of the service of Sweden into that of Prussia, and gave him a lieutenancy. A lieut., Jägersfeld, having been promoted over B.'s head, he immediately wrote to Frederick the Great as follows: "Von Jägersfeld, who has no merit except that of being son of the Markgraf of Schwedt, has been put over my head: I beg to request my discharge." The result was, that B. was put under arrest, and after repeated applications for discharge, he received from Frederick the curt intimation: "Capt. Blücher is at liberty to go to the devil!" B. went instead to his estate at Grossraddow, in Pomerania, and devoted himself to farming; but he soon tired of a bucolic life. In 1793, having returned to the army, he fought, as col. of hussars, against the French on the Rhine, evincing great genius as a leader of cavalry. The breaking out of the war of 1806 led him, as lieut.-gen., to the battle of Auerstadt. B., with the greater part of the cavalry, occupied the left flank of the prince of Hohenlohe in the retreat of Pomerania. He is accused, on this occasion, of not giving the prince due support, and thus leading to the capitulation at Prenzlau. B. himself then marched into the territory of the free town of Lübeck, and hastily fortified the city; but the French took it by storm, and B. was forced to surrender at Ratkow, near Lübeck, whither he had escaped with a few troops. A fortnight after, he was exchanged for the French gen., Victor; and immediately on his arrival in Königsburg, was sent, at the head of a corps, by sea, to Swedish Pomerania, to assist in the defense of Stralsund. After the peace of Tilsit, he was employed in the war-department in Königsburg and Berlin, and subsequently became commander in Pomerania. At a later period, he was pensioned, along with several other men of note, at the instance, it is said, of Napoleon. He was one of the few to combat the general belief in the invincibility of Napoleon, which had grown into a sort of fatalism in high places. In common with Stein and Hardenberg, he labored to remove all weak and unpatriotic counselors from the person of the king. When all the leaders of the army lost courage, his constancy revived confidence, and made him the center of all hope for the future. When the Prussians at last rose in opposition to France, B. was appointed to the chief command of the Prussians and of gen. Winzingerode's Russian corps. At the battles of Lützen, Bautzen, and Haynau, he displayed heroic courage. At the Katzbach, he defeated marshal Macdonald, and cleared Silesia of the enemy. In vain did Napoleon himself attempt to stop the "old captain of hussars," as he called him, in his victorious career. In the battle of Leipsic he won great advantage over marshal Marmont at Möckern, 16th Oct., 1813, and on the same day pressed on to the suburbs of Leipsic. On the 18th, in conjunction with the crown-prince of Sweden, he had a great share in the defeat of the French, and on the 19th his troops were the first to enter Leipsic. B., in opposition to the policy in Austria, continually pressed the taking of Paris as the real aim of the war. On the 1st of Jan., 1814, he crossed the Rhine, garrisoned Nancy on the 17th of the same month, and after winning the battle of La Rothière, pressed forward to Paris; but his scattered corps were routed by Napoleon, and he fought his way back to Chalons with great loss. On the 9th Mar., however, he defeated Napoleon at Laon; and at the end of the month, after being joined by Schwarzenberg and his corps, he again advanced towards Paris. The day at Montmartre crowned the brilliant deeds of this campaign, and, on the 31st Mar., B. entered the French capital. Frederick William III. created him prince of Wahlstadt, in remembrance of the victory at the Katzbach, and gave him an estate in Silesia. In England, whither he followed the allied sovereigns, he was received with an enthusiasm never before excited by a German. The university of Oxford conferred on him the degree of doctor of laws. After Napoleon's return in 1815, B. once more assumed the general command, and promptly led the army into the Netherlands. On the 16th June, 1815, he lost the battle of Ligny, in which he was personally in great danger, from his horse falling on him. The victory of the allies at the battle of Waterloo was completed by B.'s timely appearance on the field. B. ordered his Prussians to pursue the flying enemy, which they did the whole night. Declining the offered truce, B. marched again against Paris, and on the second taking of that city manifested a strong desire to retaliate on Paris the spoliation that other capitals had suffered at the hands of the French; but he was held in check by the

duke of Wellington. In order to reward B.'s services to Prussia and the common cause, Frederick William III. created a new order, the badge of which consisted of an iron cross surrounded by golden rays. On the 26th Aug., 1819, a colossal bronze statue was erected in his honor in his native town. B. died 12th Sept., 1819, after a short illness, at his estate of Krieblowitz, in Silesia. In Berlin, a statue twelve feet high, modeled by Rauch, and cast in bronze by Lequine and Reisinger, was erected to his memory, 18th June, 1826, and at Breslau another, also executed by Rauch, in 1827. In the beginning of the campaign of 1813, his characteristic activity and the style of his attacks gained him the nickname of "Marshal Forward" from the Russians; it soon became his title of honor throughout Germany. His tactics were always much the same: to attack the enemy impetuously, then to retreat when the resistance offered was too great for his troops to overcome; to form again at a little distance, and watch narrowly the movements of the enemy, and whenever an advantage offered itself, to charge with lightning speed, and throw him into disorder, make a few hundred prisoners, and retire ere the opposing force had recovered from its surprise. Such were his usual maneuvers. B., as a man and as a soldier, was rough and uncultivated, but energetic, open, and decided in character. His ardent enthusiasm for the liberation of Prussia and Germany from a foreign yoke, and his uncompromising pursuit of this noble aim, have justly rendered him a hero in the eyes of the German people. The old red uniform, and the old name of "Blücher's Hussars," were restored to the 5th regiment of hussars by Frederick William IV., on occasion of the centenary celebration of B.'s birthday.

BLUE, a color of which there are several varieties used in the arts, noted below. See also COLOR. Blue, or, as it is sometimes termed, *true blue,* was the favorite color of the Scottish Covenanters in the 17th century. When their army entered Aberdeen, says Spalding, there were few of them without a blue ribbon; this color being probably adopted in contradistinction to the red of the royal forces. At the battle of Bothwell bridge, the flag of the covenanting army was edged with blue. From these usages, blue seems to have become the partisan color of the whigs, but commonly in association with orange or yellow, in memory of the house of Orange and the revolution settlement. This combination of blue and yellow is seen in the liveries of certain whig families of distinction, and also in the cover of the *Edinburgh Review.* Blue is the color of the uniform of the royal navy of England; it is of a dark tint, and is known as *navy blue.*

AZURE BLUE is a pigment prepared by mixing 2 parts of deep blue, 1 of oxide of zinc, and 4 of lead glass; the latter consisting of 4 parts of minium and 1 of sand. The above azure blue is for skies, but a pigment for more general use is prepared from 11 fused boraz and 67 gray flux; the latter being itself made from 89 pebble flux, 75 minium, and 25 sand.—BERLIN BLUE. See PRUSSIAN BLUE.—BRUNSWICK BLUE, or *celestial,* is made by precipitating the alumina from a solution of alum by carbonate of soda, washing the precipitate, and adding sulphate of baryta, sulphate of iron, yellow prussiate of potash, and some bichromate of potash. When dried, this mixture is known as Brunswick blue, but when the sulphate of baryta is left out, and the material not dried, it is called *damp blue.*—CERULEAN BLUE is a color used in pottery, and consists of 79 parts of gray flux, 7 carbonate of cobalt, 14 hydrated carbonate.—BLUE COLOR OF FLOWERS, or *anthocyan,* may be obtained from those petals of flowers which are blue by digesting them in spirits of wine in the dark. The color is soluble in alcohol, but is precipitated from its alcoholic solution by water. It is changed to red by acids, and to green by alkalies.—BLUE COPPERAS, or the sulphate of copper. See COPPER.—BLUE DYES. See INDIGO, LITMUS, PRUSSIAN BLUE, and DYEING.—IRON EARTH BLUE occurs native amongst bog iron ore and in mossy districts in Europe and New Zealand. It mainly consists of a phosphate of iron with a little alumina, silica, and water. It is called *native Prussian blue.*—INDIGO BLUE, in pottery-ware, consists of 13 parts of carbonate of cobalt, 26 hydrated carbonate of zinc, and 61 gray flux.—COBALT BLUE is the only really good and serviceable blue in the coloring of glass and porcelain, and is essentially the oxide of cobalt (CoO), the coloring part of which is so great, that the addition of $\frac{1}{1000}$ part to white glass is sufficient to render it blue. Several of the compounds named above owe their blue color to this substance. See COBALT.—DEEP BLUE is employed in porcelain coloring, and is made from 1 part of oxide of cobalt, 4 glass of lead (2 minium, 1 white sand), 1 lead glass (2 minium, 1 sand, 1 calcined borax), and 1 oxide of zinc, all of which are placed together in a porcelain crucible, fused for 2 or 3 hours; the residue washed, dried, and ground to a fine powder.—KING'S BLUE is made from 29 parts carbonate of cobalt, 29 sand, and 42 carbonate of potash, by fusing these ingredients in a crucible. The residue is intense deep blue, bordering on a black blue, and is generally reduced to powder, and re-fused with about half its weight of pebble flux (3 minium or litharge, and 1 sand).—MINERAL BLUE and PARIS BLUE. See PRUSSIAN BLUE.

PRUSSIAN BLUE is the deep blue color which is so frequently seen on cotton, muslin, and woolen handkerchiefs and dresses. It was discovered in the year 1710 by Diesbach, a color-maker in Berlin, and hence called *Berlin blue.* The mode of its manufacture was published in Britain, by Dr. Woodward, in 1724. It may be prepared in several ways: 1. By the addition of a solution of yellow prussiate of potash (ferrocyanide of potassium) to a solution of sulphate of iron (green vitriol). The blue compound thus produced deepens in tint when exposed to the air; and where it is required of greater consistence

or more *body*, some alum and carbonate of potash are added to the prussiate solution before mixing with the iron solution. 2. By mixing solutions of yellow prussiate of potash and perchloride of iron, which yields the variety known as *Paris blue*. 3. By adding a solution of the red prussiate of potash (ferrocyanide of potassium) to a solution of sulphate of iron, and this mode of preparation gives *Turnbull's blue*. The Prussian blue settles to the bottom of the mixing vessels, and may be collected and dried by exposure to the air, when it is obtained as a blue powder. If heat be applied during the drying, the material cakes, and when cut, exhibits a lustre and hue like copper. When alum has been used in its manufacture, the product has a dull earthy fracture. The composition of Prussian blue is that of a ferrocyanide of iron. See CYANOGEN. It is employed by washerwomen, under the name of *blue*, for neutralizing the yellow tint of cotton and linen clothes; by paper-makers, to color paper; and is very largely employed as a pigment in Calico-printing (q.v.) and Dyeing (q.v.). *Mineral blue* is formed when the Prussian blue is precipitated along with a solution of zinc or magnesia, or moist carbonates of zinc or magnesia are added during the precipitation of the color. In the formation of *royal blue*, a solution of tin is added, and *steam blue* is produced on the addition of solutions of tartaric acid and yellow prussiate of potash. The impurities liable to be present in Prussian blue are starch, chalk, and stucco, either of which necessarily decreases the intensity of the blue color, and the utility of the substance.

SAXONY BLUE is prepared by dissolving indigo (q.v.) in Nordhausen sulphuric acid, and was first manufactured in Saxony in the year 1810, by taking the very finely powdered indigo and incorporating it with the acid cautiously heated, when the indigo dissolves, and yields a blue color of great depth of tint. It is largely used in dyeing (q.v.). —OLD SEVRES BLUE is a cobalt blue used in pottery, and is made up of 19 parts oxide of cobalt, 39 dry carbonate of soda, 3 dry borax, and 39 sand.—THENARD'S BLUE is the blue formed by heating alum with a solution of cobalt, or it may be formed by igniting a mixture of phosphate or arseniate of cobalt with eight times its weight of alumina in the hydrated state procured by precipitation from alum by ammonia. Used in pottery.—TURQUOISE BLUE is composed of 3 of oxide of cobalt, 4 of alumina, and 1 oxide of zinc. It is manufactured by dissolving the oxides of zinc and cobalt in dilute sulphuric acid, adding the liquid to a solution of 40 parts of ammonia alum, drying up and igniting at a red heat for several hours. The addition of a little chromate of mercury gives it a geeen shade.—VARIEGATED BLUE is used for coloring porcelain, and is formed by fusing 10 oxide of cobalt, 9 oxide of zinc, 5 lead glass (2 minium, 1 sand, and 1 calcined bones), and 25 glass of lead (2 minium and 1 sand).

BLUE STONE, or BLUE VITRIOL, is sulphate of copper. See COPPER.

BLUEBEARD, the name given to the hero of a well-known tale of fiction, which is of French origin. According to this romance, the chevalier Raoul has a blue beard, from which he gets his designation. This personage tests his wife's curiosity by intrusting her, during his absence on a journey, with the key of a chamber, which she is forbidden to enter. She is unable to stand the test, and he puts her to death. Several wives share the same fate, but at length the seventh is rescued at the last moment by her brothers, and B. is slain. The tale appears in innumerable collections, under various forms. Tieck, in his *Phantasus*, has worked up this material into a clever drama, with numerous romantic and satirical additions, and Grétry has made use of it in his opera of *Raoul*.

The historic original of chevalier Raoul would appear to be one Giles de Laval, lord of Raiz, who was made marshal of France in 1429, and fought valiantly in defense of his country when invaded by the English; but his cruelty and wickedness seem to have eclipsed even his bravery, as he is remembered chiefly for his crimes, which credulous tradition has painted in the blackest and most fearful colors. He is said to have taken a pleasure, among other atrocities, in corrupting young persons of both sexes, and afterwards in murdering them for the sake of their blood, which he used in his diabolical incantations. Out of this fact, in itself probably half mythical, the main feature of the tale of B. has probably grown. Laval was burnt alive in a field near Nantes, in 1440, on account of some state crime against the duke of Brittany.

BLUE-BELL. See HYACINTH.

BLUE BIRD, BLUE WAR'BLER, BLUE RED'BREAST, or BLUE RO'BIN (*sylvia sialis*, or, according to the most recent ornithological systems, *erythaca* or *sialia Wilsoni;* see SYLVIADÆ), an American bird, which, from the confidence and familiarity it displays in approaching the habitations of men, and from its general manners, is much the same sort of favorite with all classes of people in the United States that the redbreast is in Britain. Except in the southern states, it is chiefly known as a summer bird of passage, appearing early, however, as a harbinger of spring, and visiting again "the box in the garden, or the hole in the old apple-tree, the cradle of some generations of ancestors." Few American farmers fail to provide a box for the B. B.'s nest. In size, the B B. rather exceeds the redbreast, which, however, it much resembles in general appearance. Its food is also similar The upper parts of the B. B. are of a rich sky-blue color, the throat and breast are reddish chestnut, and the belly white. The female is duller in colors than the male. The B B. lays five or six pale-blue eggs, and has two or three broods in the season. Its song is "a soft agreeable warble." The male is remarka-

bly attentive to his mate, and both exhibit extraordinary courage in driving away intruders from the vicinity of their nest. A hen, with her brood, has been seen to flee from the attacks of an enraged and pugnacious blue bird.—The B. B. is known as an inhabitant of the Bermudas, Mexico, the West Indies, Guiana, and Brazil.—In the western and in the more northern parts of North America, its place is taken by nearly allied and very similar species.

BLUE-BOOKS, the name popularly applied to the reports and other papers printed by parliament, because they are usually covered with blue paper. The term was, for like reasons, long applied to the reports sent annually by the governors of colonies to the colonial secretary; and even in technical official phraseology, these are called "blue-books." The practice of printing, and to some extent publishing, the proceedings of the house of commons, began in the year 1681, when disputes ran high on the question of excluding the duke of York from the succession to the throne. The proceedings on the occasion are extremely interesting. It was stated, that especially after parliaments were dissolved, false accounts of their proceedings were circulated, and, as a remedy, sir John Hotham moved that the votes and proceedings of the house be printed. Mr. Secretary Jenkins opposed the motion, saying: "Consider the gravity of this assembly: there is no great assembly in Christendom that does it; it is against the gravity of this assembly, and is a sort of appeal to the people." He was answered by Mr. Boscawen: "If you had been a privy council, then it were fit what you do should be kept secret, but your journal-books are open, and copies of your votes in every coffee-house, and if you print them not, half votes will be distributed to your prejudice. This printing is like plain Englishmen, who are not ashamed of what they do, and the people you represent will have a full account of what you do." Col. Mildmay said: "If our actions be nought, let the world judge of them; if they be good, let them have their virtue. It is fit that all Christendom should have notice of what you do, and posterity of what you have done—and I hope they will do as you do, therefore I am for printing the votes." The motion was carried. See *Parl. Hist.* iv. 1307; *Kennet*, iii. 396. The documents printed by the house of commons accumulated gradually in bulk and variety, until they reached their present extent. In 1836, the house adopted the practice of selling their papers at a cheap rate. A curious legal and constitutional question immediately arose out of this practice, a publisher having taken proceedings for libel against the officers concerned in circulating the papers, because it was stated in a report concerning prisons that the prisoners read indecent books printed by him. The chief contents of these papers at present are—the votes and proceedings of the house; the bills read in their several stages; the estimates for the public services of each year; the accounts of the expenditure of the moneys voted in the previous year; any correspondence or other documents which the ministry may voluntarily, or at the demand of the house produce, as connected with a question under discussion; reports of committees of inquiry appointed by the house; reports of commissions of inquiry appointed by the crown; and annual reports by the permanent commissions and other departments of the government, stating their proceedings during the year. The blue-books of a session, when collected and bound up, now often fill 50 or 60 thick folio volumes. Nothing can seem more hopelessly chaotic than those of a few sessions huddled together unarranged. It deserves to be known, however, that they are all printed according to a peculiar sequence, which enables the whole papers of a session to be bound up in such an order that any paper can be found by consulting an ample index in the last volume. In any library where the blue-books are preserved and properly bound up, the most trifling paper of any session may thus be found with ease; and it need hardly be said that with much that is useless or unimportant, there is an enormous mass of valuable matter hidden in the blue-books.

There is no doubt, however, that although the means are thus provided for finding what the blue-books contain, their contents are heterogeneous, and to a great extent cumbersome and valueless. They are not prepared on any uniform system, or subjected to general revision, or what may be called editing. Each officer prepares his own report in his own way, sometimes lauding his own services, or arguing in favor of his own peculiar principles on some public question, so that it has been remarked that the B. contain a large number of articles like those in the periodical press, but too cumbersome and dull to get admission there. It has been matter of complaint that the public are burdened with the expense of widely distributing such documents. It is stated in a treasury minute, circulated among the government departments in May, 1858, with the view of in some measure remedying the abuse, "that the cost of printing the report of the commissioners appointed to inquire into the endowed schools of Ireland, and the three volumes of evidence and appendices (including the cost of the paper), was £5200, and that the weight of the paper used in printing them was about 34 tons."

BLUE-BOTTLE FLY. See FLESH-FLY.

BLUE CARDINAL. See LOBELIA.

BLUE-COAT SCHOOL, the name ordinarily given to Christ's hospital, London, in which the boys wear blue coats or gowns, according to an old costume. See CHRIST'S HOSPITAL.

BLUE EARTH, a co. in s. Minnesota along the Minnesota river, reached or intersected by the Winona and St. Peter, the St. Paul and Sioux City, and the Minnesota and Northwestern railroads; 750 sq.m.; pop. '80, 22,889. The main business is agriculture. Co. seat, Mankato.

BLUE-EYE, *Entomyza cyanotis*, a beautiful little bird, abundant and very generally dispersed in New South Wales, although not found in the more southern Australian colonies. It is a species of honey-eater (q.v.) or honey-sucker, and is sometimes called the blue-cheeked honey-eater. The B. seeks its food almost exclusively among the blossoms and small leafy branches of *eucalypti*. Its food consists partly of insects and partly of honey; perhaps also of berries. It is a bold and spirited bird, of most elegant and graceful movements. Numbers are often seen together, clinging and hanging in every variety of position, frequently at the extreme ends of the small thickly-flowered branches, bending them down with their weight.

BLUEFIELDS, a river of the Mosquito territory, in Central America, which, after a course of several hundred m. to the e., enters the Caribbean sea in lat. 12° n., and long. 83° west. Its lower stream is navigable to a distance of 80 m. from the sea. At its mouth is a good harbor, above which stands a town of the same name, formerly the residence of the king of the Mosquito territory (q.v.).

BLUEFISH, *Temnodon saltator*, a fish of the family *scomberidæ*, of a genus having no detached finlets, no isolated dorsal spines, and no lateral armature of the tail, two dorsal fins, the first of which is small, and two deeply-hidden spines in front of the anal fin. The only known species is a native of the east coast both of North and South America. The upper parts are of a bluish color, the lower parts whitish, a large black spot at the base of the pectoral fins. The mouth is crowded with teeth, the jaws are furnished with large ones. The B. preys on other fishes, as the weak-fish, menhaden, and mackerel, the shoals of which it pursues. It is very swift, strong, and voracious. It sometimes attains a length of 3 ft., and a weight of 14 lbs. It is much esteemed for the table, and great numbers are brought to market in New York, Philadelphia, and other towns about the end of summer. It is often caught by trolling, as it bites readily at any object drawn swiftly through the water. It frequently ascends rivers even to fresh water.

BLUE-GOWNS, the name commonly given to a class of privileged mendicants in Scotland. The proper designation of these paupers was the king's bedesmen or beadsmen. In ancient times, a beadsman was a person employed to pray for another. See BEAD. From practices of this kind, there sprang up a custom in Scotland of appointing beadsmen with a small royal bounty, who ultimately degenerated into a class of authorized mendicants. Each of the beadsmen on his majesty's birthday received a gown or cloak of blue cloth, with a loaf of bread, a bottle of ale, and a leathern purse containing a penny for every year of the king's life. Every birthday, another beadsman was added to the number, as a penny was added to each man's purse. The most important part of the privilege was a large pewter badge, attached to the breast of the gown, which, besides the name of the bearer, had the inscription, *pass and repass*. This inferred the privilege of begging, and bespoke the kindly consideration of all to whom the beadsman appealed for an alms or a night's lodging. The fictitious character of Edie Ochiltree, in Sir Walter Scott's tale of the *Antiquary*, is a fair sample of this ancient and picturesque fraternity. The practice of appointing beadsmen was discontinued in 1833, at which time there were sixty on the roll. The whole have since died out. The last beadsman drew from the exchequer in Edinburgh his last allowance in May, 1863.

BLUE GRASS, or JUNE GRASS, *Poa pratensis*, a species common in this country and Europe, attaining its highest perfection in Kentucky, where a large region in the middle of the state is called the "blue-grass country," and is noted for its excellent cattle.

BLUEING OF METALS. See TEMPERING METALS, *ante*.

BLUE LAWS, a name given to certain enactments supposed to have been made by the New Haven colony, in Connecticut, in the early days of the settlement. These "laws" never existed; but as usual in the Puritan days the personal conduct of citizens was often subject to judicial supervision and animadversion, and Sabbath-breaking was especially odious to the magistracy. Currency was given to the idea of a code of severe and ridiculous enactments called the blue laws by the notorious tory minister, the Rev. Samuel A. Peters, who had charge of the English churches in Hartford and Hebron, but who was compelled by the revolution to fly to England. There, in 1781, he published his *General History of Connecticut*, a work whose exaggerations and spite make it almost a curiosity. Many years ago a small book containing these supposed laws, which were really extracts from Peters' history, was published, and is even now referred to as authority by some who have not investigated the subject.

BLUE LICK SPRINGS, a village in Nicholas co., Ky., on Licking river, 40 m. n.e. of Frankfort, noted for mineral waters, which are sent in bottles to many parts of the country. They contain lime, magnesia, soda, carbonic acid, sulphureted hydrogen, sulphates, and muriates.

BLUE-MANTLE, the title of an English pursuivant-at-arms. See PURSUIVANT.

BLUE MONDAY, so-called from a custom in Europe in the 16th c. of decorating churches in blue colors on the Monday preceding Lent, when the people had a holiday; but the excesses committed led to the legal abolition of the custom. In the United States women in some of the rural districts called every Monday by the name, as it is the general day for doing the hard laundry work of the week. In the city any Monday may be blue to workmen who on the day before spend their weekly wage unwisely.

BLUE MOUNTAINS, the name of two mountain chains, the one in New South Wales, the other in Jamaica.—1. The B. M. of New South Wales run very nearly parallel with the coast, and being impassable by nature, long threatened to cut off the maritime part of the colony from the interior. To cross this apparently insurmountable barrier was the grand aim of the colony during the first 24 years of its existence, surgeon Bass, the discoverer of the strait that bears his name, standing pre-eminent among the adventurous and patient explorers. It was not till 1813 that a practicable passage was found, or rather made, for it terminated towards the w. in a zigzag road down a nearly perpendicular height of 670 ft.; but it was not before 25th April, 1815, that gov. Macquarie, with a numerous retinue, actually opened a route into the Bathurst plains, then yielding the richest pasturage in the colony, and now forming its gold-field. The highest point of the B. M., Mt. Beemarang, is 4100 ft. high, and some parts of the road which crosses them are about 3400 ft. above the sea. A line of railway crosses the B. M., in the construction of which great engineering difficulties have been overcome, part of it being carried along the face of a precipitous mountain.—2. The still loftier range of the same name in Jamaica traverses the whole length of the island, and in some places attains an altitude of 7000 feet.

BLUE PETER, a blue flag with a white square in the center, used to signify that the ship on which it is raised, or the fleet of which that is the flagship, is about to sail. "Peter" is a barbarism for the French *partir*, a notice of departure.

BLUE PILL, *Pilula hydrargyri*, is the most simple form in which mercury can be administered internally. It consists merely of *two* parts of mercury rubbed up with three parts of conserve of roses, till globules of mercury can no longer be detected; to this is added powdered licorice-root, so that a pill of five grains contains one grain of mercury.

In cases of torpid condition of the liver or inflammation of that organ, B. P. is much used as a purgative, either alone or combined with some other drug, such as rhubarb. When it is given with the view of bringing the system under the influence of mercury (salivation, q.v.), small doses of opium should be added to counteract its purgative tendency, and the state of the gums watched carefully from day to day, so that the first symptoms of salivation may be noticed, and the medicine omitted. As a purgative, the common dose of B. P. is one or two pills of five grains each, followed by a purgative draught. When the system is to be saturated with it, or salivated, one pill may be given morning and evening, or one every night combined with $\frac{1}{4}$ of a grain of opium, repeated till the gums become sore. But the sensibility to the action of mercury varies with the individual; some may take large quantities before it exhibits its physiological symptoms, and on the other hand, three blue pills, one taken on three successive nights, have brought on a fatal salivation. When taking blue pills, all sudden changes of temperature should be avoided; and, indeed, though they are found in every domestic medicine-chest, neither they nor any other form of mercury should be given without good cause and without the greatest caution.

BLUE RIDGE, the most easterly range of the Alleghanies, in the United States. It forms an almost continuous chain from West Point in New York down to the n. of Alabama, through New Jersey, Pennsylvania, Virginia, the Carolinas, and Georgia. It divides Virginia into eastern and western. Mt. Mitchell, in North Carolina, the loftiest point of the B. R., is 6470 ft. above the sea; while the Otter peaks in Virginia, next in elevation, have an altitude of 4200 feet.

BLUE RIVER, in e. Indiana, running s.w. and forming the e. fork of White river. It affords abundant water-power to Newcastle, Shelbyville, and other manufacturing villages.

BLUE RIVER, or BAHR-EL-AZBAK. See NILE, *ante*.

BLUE STOCKING, a name given to learned and literary ladies, who display their acquirements in a vain and pedantic manner, to the neglect of womanly duties and graces. The name is derived from a literary society formed in London about the year 1780, which included both men and women. A gentleman of the name of Stillingfleet, who was in the habit of wearing blue stockings, was a distinguished member of this society; hence the name, which has been adopted both in Germany and France.

BLUETHROAT, or BLUEBREAST, also called bluethroated warbler and bluethroated robin (*phœnicura suecica*, or *sylvia suecica;* see SYLVIADÆ), a beautiful bird, a very little larger than a redbreast, and much resembling it, but having the throat and upper part of the neck of a brilliant sky-blue, with a spot in the center, which in some specimens is pure white, and in very old males is red. Below the blue color is a black bar, then a line of white, and again a broad band of bright chestnut. The B. is well known as a summer bird of passage in many parts of Europe, from the Mediterranean sea to the

Arctic ocean, but is very rare in Britain, only a few instances of its occurrence having been recorded. It is supposed to spend the winter in Africa. Great numbers are caught for the table in Lorraine and Alsace. The bird is one of those known by the names of *becfin* (q.v.) and *beccafico* (q.v.), and esteemed a delicacy. It is a bird of very sweet song. It imitates, to an unusual degree, the notes of other birds, so that the Laplanders give it a name which signifies a bird of a hundred tongues.

BLUE VITRIOL. See COPPER, *ante*.

BLUEWING, according to some naturalists, a genus of *anatidæ*, which has been named *cyanopterus* (by a sort of Greek translation of the English name), but more generally regarded as a mere section or subsection of the restricted but still large genus *anas*. See DUCK. The tail-feathers are only 14 in number, instead of 16, as in the common duck, teal, etc.; but the character from which the name is derived is, after all, that which chiefly distinguishes the bluewings, and never fails to arrest attention. The best known species, the common or lunate B. (*anas* or *cyanopterus discors*), is generally called the blue-winged teal in the United States of America, where it is very abundant. Vast numbers spend the winter in the extensive marshes near the mouths of the Mississippi, to which they congregate both from the north and from the coast regions of the east; but the summer migrations of the species extend as far n. as the 57th parallel, and it is plentiful on the Saskatchewan in the breeding season. It breeds, however, also in the marshes of the south, even in Texas; and is common in Jamaica, where it is supposed to be not a mere bird of passage, but a permanent resident. None of the duck tribe is in higher esteem for the table, and it has therefore been suggested that the B. is particularly worthy of domestication, of which it seems to be very easily susceptible. In size it is rather larger than the common teal; in the summer plumage of the male, the upper part of the head is black, the other parts of the head are of a deep purplish blue, except a half-moon shaped patch of pure white before each eye; the prevalent color of the rest of the plumage on the upper parts is brown mixed and glossed with green, except that the wings exhibit various shades of blue, the lesser wing-coverts being of a rich ultramarine blue, with an almost metallic luster; the lower parts are reddish orange spotted with black; the tail is brown, its feathers short and pointed.—The B. is a bird of extremely rapid and well-sustained flight. The flocks of the B. are sometimes so numerous and so closely crowded together on the muddy marshes near New Orleans, that Audubon mentions having seen 84 killed by the simultaneous discharge of the two barrels of a double-barreled gun.—There are other species of B., also American; but this alone seems to visit the more northern regions.

BLUM, ROBERT, was born in very humble circumstances at Cologne, 10th Nov., 1807. After a brief military service in 1830, he became scene-shifter, afterwards secretary and treasurer, to Ringelhardt, director of a theater at Cologne, and subsequently at Leipsic, in which situation he remained, devoting his leisure time to literature and politics until 1847, when he established himself as bookseller and publisher. In 1840, he founded at Leipsic the *Schillers-Verein*, i.e., Schiller's society, which celebrated the poet's anniversary, as a festival in honor of political liberty. In 1845, he acquired, in connection with the German Catholic movement and the political outbreaks in Leipsic, great reputation as a popular orator; and in 1848, was elected vice-president of the provisional parliament at Frankfort, and as such he ruled that turbulent assembly by presence of mind and a stentorian voice. In the national assembly he became leader of the left; and was one of the bearers of a congratulatory address from the left to the people of Vienna, when they rose in October. At Vienna he joined the insurgents, was arrested, and shot on the 9th Nov. B. was a man of strong character, of great natural intelligence, and a speaker of stirring eloquence. For heading a party, he possessed cleverness and ambition enough, but he had not that passion and fanaticism which scorns to consider the consequences likely to flow from unbridled popular license. The news of his execution caused an indignant outcry among the democrats in Germany, who, besides instituting commemorations for the dead, made an ample subscription for his widow and children.

BLUMENBACH, JOHANN FRIEDRICH, a very eminent naturalist, was b. at Gotha, 11th May, 1752. He studied at Jena and Göttingen, in the latter of which universities he became extraordinary professor in 1776, and ordinary professor in 1778. Here he lectured for fifty years on natural history, comparative anatomy, physiology, and the history of medicine. In 1785, consequently before Cuvier, he made natural history dependent on comparative anatomy. His *Manual of Comparative Anatomy and Physiology* has been translated into almost all the principal languages of Europe. The natural history of man was always his favorite study; and his *Collectio Craniorum Diversarum Gentium*, commenced in 1791 and completed in 1808, gave to the learned world the result of his observations on the skulls of different races, of which he had an extensive collection (see ETHNOLOGY). He published many other works on natural history, all of which were favorably received; for, both as a writer and a lecturer, he was eminently successful. His *Manual of Natural History*, indeed, has gone through 12 editions. Towards the end of the 18th c., he visited England, where he met with a distinguished reception from the most famous naturalists. On the 19th Sept., 1825, his friends celebrated the jubilee of his doctorate, presented him on the occasion with a medal struck on purpose, and founded an exhibition in his name, the proceeds of which were to assist young

physicians and naturalists in the prosecution of their researches by travel In 1835, the increasing infirmities of age compelled him to resign his academical functions. He died on the 22d Jan., 1840.

BLUNDERBUSS is a kind of short musket with a very wide bore, sufficient to take in several shot or bullets at once. It has a limited range, but is very destructive at close quarters. As a military weapon, it is chiefly of service in defending passages, doorways, staircases, etc. Some of the English and German troopers in the 17th c. were armed with the B ; but the carbine has since nearly superseded this weapon.

BLUNT, EDMUND, 1799–1866; b. Mass.; son of Edmund March; hydrographer and marine surveyor, engaged on his own account on the United States coast and in the West Indies, and appointed first assistant in the government coast survey. He introduced the use of the Fresnel light in American light-houses.

BLUNT, EDMUND MARCH, 1770–1862; b. N. H.; author of the *American Coast Pilot*, a most useful work for navigators, which has passed through nearly 30 editions, and been translated into several other languages. He published many other nautical works, charts, etc.

BLUNT, JAMES G., b. Maine, 1826; brig.gen. commanding the department of Kansas during the civil war. He was made a maj.gen. in 1862.

BLUNT, JOHN JAMES, 1794–1855; an English clergyman, author of *Vestiges of ancient Manners and Customs discoverable in Modern Italy and Sicily, Undesigned Coincidences in the Writings both of the Old and New Testaments an Argument of their Veracity, History of the Christian Church in the first three Centuries*, and *Sketches of the Reformation of the Church of England.*

BLUNTSCHLI, JOHANN KASPAR, b. Switzerland, 1808; a German jurist; graduated at Bonn in 1829. He was prof. in the university of Zurich, a member of the grand council of the local government, and strongly opposed the civil war of 1847–48. In 1848 he became prof. of German and international law at Munich, and in 1861 prof. of political science at Heidelberg. In 1864, with Baumgarten and others, he founded the Protestant union, and subsequently presided over several Protestant conventions, and over the general synod at Baden in 1867. He was in favor of a union between south and north Germany, and was elected to the customs parliament. B. is the author of many valuable works on politics, laws, and the sciences.

BLUSHING, a sudden reddening of the face, neck, and breast, owing to some mental shock, most commonly of the character of humiliation or shame. The nature and cause of this effect have been recently elucidated by physiological researches. It is produced by an increased flow of blood into the capillary vessels over the parts where the blush extends. Besides reddening the complexion, it creates a sensible augmentation of heat in those parts. The feeling that accompanies the state is of a distressing kind

The phenomenon of B. is part of a general influence exerted on the capillary circulation by mental causes operating through the brain. The experiments whereby the existence of this influence has been established, may be described as follows: The *small blood-vessels*, by which the blood is brought into proximity with the various tissues of the body, are kept in a state of balanced distension between two forces, the one the propulsive power of the heart's action, which fills and distends them; the other, an influence derived from the nervous centers, and acting upon the muscular fibers so as to contract the vessels. The first of the two forces—the agency of the heart—is quite well understood: it is simply like the case of distending the hose of a fire-engine by working the pump, and driving the water along. The counteracting force of the nerve-centers is proved by the following experiments: When the sympathetic nerve proceeding to the vessels of the head and face of an animal is cut, there follows congestion of the blood-vessels with augmented heat over the whole surface supplied by the nerve. The ear is seen to become redder; a thermometer inserted in the nostril shows an increase of temperature, the sign of a greater quantity of blood flowing into the capillaries. The inference from the experiment is that, from the withdrawal of a counterpoise, the force that *distends* the small blood-vessels—that is to say, the heart's action—has an unusual predominance. It is further proved that this nervous influence, acting upon the minute muscular fibers of the small vessels, proceeds from the nerve-centers lodged in the head, for, by cutting the connection between the brain and the ganglion in the neck, from which the above-mentioned nerve is derived, the same restraining influence is arrested, and the congestion takes place. By stimulating the divided nerve galvanically, the suffusion disappears, the vessels shrinking by the galvanic contraction of their muscular coats.

The agency now described is of a piece with the action of the brain upon involuntary muscles generally, as the heart and the intestinal canal, and by it many organic functions—digestion, nutrition, absorption, etc.—are affected by those changes in the cerebral substance that accompany mental states. It is known that mental excitement has an immediate influence in all those functions; one set of passions, such as fear, tend to derange them, while joy and exhilaration operate favorably upon them.

To apply these observations to the case in hand. Supposing a person in the average mental condition, and something to arise which gives a painful shock to the feelings—

a piece of ill news, a reproach from some one whose good opinion is much valued, an open shame, or the fear of it, a fit of remorse, an occasion of grief—the pain is accompanied with a sudden loss, or waste, or decrease of cerebral power; none of the functions that the brain aids in maintaining is so strongly stimulated as before; and in particular, that stream of nervous energy which balances the heart's action in regulating the distension of the small blood-vessels, is abated, the abatement being made apparent in the redness and heat over the face and neck. In a great stroke of mental depression, the influence is of a much more extensive kind, though still of the same nature essentially as regards the enfeeblement of the nervous energy, and may lower the action of the heart itself: in which case there will be a wide-spread pallor, perhaps without a blush. In all probability, it is when the loss of cerebral influence extends only to the relaxation of the muscular fibers of the small vessels, leaving the heart in its usual vigor, that the state of B. is most fully manifested. Hence it is more apt to arise out of the smaller modes of painful apprehension than from the more serious calamities that prostrate the system throughout.

It is said that, in the Circassian slave-market, a young woman that blushes fetches a higher price. Some complexions do not show the increased flow of blood in this way, and all persons are not equally sensitive to the cerebral shock that causes it.

BOA, in popular language, the name of all those large serpents which kill their prey by entwining themselves around it, and constricting it in their coils; but by zoologists of the present day, limited as the name of a genus to a very small portion of their number, all of which are natives of the warm parts of America—the similar large serpents of Asia and Africa forming the genus *python* (q.v.). The name B., however, was certainly not originally applied to American serpents, for it is used by Pliny, who accounts for its origin by a fable of serpents sucking the milk of cows, thus referring it, very improbably, to the Latin *bos,* an ox. The Linnæan genus B. comprehended all serpents having simple subcaudal plates, but without spur or rattle at the end of the tail, and was thus very artificial, as founded chiefly upon a single unimportant character, and consisted of a very miscellaneous assemblage of species, venomous and non-venomous. The B. family, or *boïdæ,* as now constituted (containing the *pythons,* etc., of the old world, as well as the true *boas* of the new), is almost exclusively confined to tropical climates, and all the species are of large size and great strength, some of them far exceeding in these respects all other serpents. The story related by the ancients of a serpent 120 ft. in length, which devoured several soldiers, and caused alarm to a Roman army in Africa, may perhaps be deemed unworthy of credit, although the skin is said to have been long preserved at Rome; but there is good reason to believe that serpents in more modern times have attained at least half this length, and have made even the larger mammalia, and sometimes man, their prey. The *boïdæ* are not venomous; but their mouth, although destitute of poison-fangs, is so furnished with teeth as to make their bite very severe. Their teeth are numerous, long, and directed backwards, so as the more effectually to prevent the escape of the prey, which is first seized by the mouth, and then the serpent, with a rapidity of motion which the eye of the closest observer fails perfectly to follow, coils itself around it; the powerful muscles of the body are afterwards brought into action to compress it, so that usually in a few minutes its life is extinct, and its bones are broken. Deglutition then takes place—not, as has been alleged, after the prey has been licked and covered with saliva by the tongue, but accompanied with an extraordinary flow of saliva, which seems not only to serve for lubrication, but to have the property of hastening the decomposition of animal substances, and so to assist in making the prey more easy to be swallowed. It is always swallowed entire, and the process is sometimes rather a tedious one, and seems to require no small muscular effort; but the muscles of the serpent are capable of acting for this purpose, even at the neck, when that usually narrowest part of the body is distended to an enormous degree as the prey passes through it. The lower jaw is not simply articulated to the skull, but by the intervention of other bones, a structure without which the prodigious dilatation of the throat would be impossible. The lungs consist of two lobes, one much larger than the other, and at the extremity of the larger is an extremely capacious air-bag, which is supposed to serve for the necessary aëration of the blood whilst respiration is impeded in the process of deglutition.

The tail in all the boïdæ has great prehensile power, and its grasp of a tree round which it may be coiled is aided by the opposing action of two claws, one on each side of the anus, which are really the representatives of the hinder limbs of the superior vertebrate animals, and which, on dissection, are found to be connected not only with strong muscles, but with bones entirely concealed within the serpent, one jointed to another, so as to make the character of a rudimentary limb very apparent. These serpents, being almost all inhabitants of watery places, often lie in wait for animals that come to drink; thus the largest of the American species, *boa* (*eunectes*) *murina*—sometimes called anaconda, although anaconda seems to be originally, like B., the name of a serpent of the old world—is to be found where rivers or narrow lagoons are overshadowed by gloomy forests. Perhaps the want of sufficient supplies of water, more than the greater cold of the climate, may account for the short time that specimens of the boïdæ brought to Europe have generally lived in confinement.

After a repast, these serpents spend a considerable time in a state of comparative torpidity—several weeks generally elapsing before they waken up to require a new supply—and in this lethargic state they are easily killed. When they do waken up, the demands of appetite seem to be very urgent. Many of our readers must still remember the interest excited some years ago concerning a B. in the London zoological gardens, which, to the astonishment of its keepers, swallowed its rug; but this, after a trial of a week or two, it found indigestible, and the animal then gratified public curiosity by a reversal of the process of deglutition.

The head in the *boïdæ* is thick, yet somewhat elongated; the eyes are small; the body is thickest in the middle; the tail usually has a blunt termination. The scales are numerous and rather small. The colors are various, and in many of the species rather bright and elegantly disposed. The true boas have the plates underneath the tail single, whilst in the pythons they are double. The species to which the name *boa constrictor* is appropriated is far from being one of the largest, seldom attaining a length of more than 12 feet. It is common in Surinam and Brazil, where its skin is used for making boots and saddle-cloths. The name *boa constrictor* is, however, popularly extended to almost any of the species.—The number of species, whether in the genus or in the family, is far from being well ascertained.

Boas are much infested by intestinal worms, which appear often to cause their death. The excrement of the B.—the urine and fæces being combined as in other reptiles, and voided by a single vent—is a solid white substance, and consists mainly of urate of ammonia, accompanied by phosphate of lime (bone-earth). It is employed as an easy source of uric acid.

BOADICE'A, a warrior-queen of the Iceni, a tribe inhabiting the eastern coast of Britain, in the time of the Romans. She flourished after the middle of the 1st century. Prasutagus, her husband, who died A.D. 60, or 61, had left his wealth jointly to the Roman emperor Nero, and to his two daughters, hoping that by this artifice his kingdom would be protected from oppression; but the Roman soldiery, taking advantage of the defenseless condition of the country, began to plunder unscrupulously. B. herself was scourged, her daughters were violated, and the noblest among the Iceni were treated as slaves. These outrages soon drove the Britons to revenge. B. gathered round her a large army; attacked and captured the Roman colony of Camalodunum; defeated Petilius Cerealis, legate of the ninth legion, who was marching to its relief; took Londinium and Verulamium; and destroyed, it is said, somewhere about 70,000 Romans, many of them by torture. Suetonius, the Roman governor of Britain, now advanced at the head of 10,000 men against B., who, we are informed, had under her command no less than 263,000. A dreadful battle ensued (62 A.D.), in which, according to Tacitus, 80,000 Britons perished, and only 400 Romans. These figures, of course, cannot be trusted; but the victory must have been decisive, as it finally established the authority of the Romans in Britain. B., overwhelmed with despair, committed suicide.

BOAR, WILD, *Sus scrofa*, a species of *suidæ*, regarded as the original of the domestic swine, equal to the largest in size, and far superior in strength and ferocity. It is of grayish-black color, covered with short woolly hair, thickly interspersed with stiff coarse bristles, which assume the form of a mane along the spine. Its great tusks are formidable weapons, but when old the tusks curve over the snout, and are no longer serviceable for goring; but then the teeth of the upper jaw protrude and curve outward, serving the same purpose as the tusks had done. The animal is native in Europe and Asia, inhabiting the deep recesses of marshy forest grounds. Boars were common in England until the time of Henry II., and then not found until, in the reign of Charles I., an unsuccessful attempt was made to raise them in the New Forest. In the time of the conqueror any one killing a wild boar was liable to have his eyes put out. It was for many centuries a favorite beast of chase with the nobles in Europe, and was hunted chiefly on foot with the spear, its strength and ferocity rendering the sport alike exhilarating and dangerous. There is little of boar-hunting now except in India. The animal seeks its food at night, and feeds chiefly on roots and grain, though it will eat smaller animals, birds' eggs, etc. The bristles of the boar are much used for brushes.

BOARD, the general name applied to persons in special duties assigned to him. There are two civil or political lords, and three naval or sea lords. The first lord, who is always a cabinet minister, besides a general control, has the management of naval estimates, finance, political affairs, slave-trade prevention, appointments, and promotions. The first naval lord manages the composition and distribution of the fleet, naval discipline, appointment of inferior officers, commissioning ships, general instructions.

BOARD—BOARDING. In nautical language, *board* is used with many significations. Besides its ordinary application to a plank of wood, B. is a space or portion of sea over which a ship passes in tacking; hence the phrases, "to make a good board," "to make short boards," "to make a stern board," "to leave the land on back-board," etc.—all of which refer to the direction of a ship's movement at a particular time and place. Again, *board* or *aboard* relates to the interior of the ship, in such phrases as "to go aboard," "to heave overboard," etc.

But the most important of these meanings is that which relates to the *boarding* of an enemy's ship, or making a forcible entry for the sake of capturing it. Whenever this

bold operation is determined on, certain seamen are told off to act as boarders. It is very rarely that, between two men-of-war, this operation is ventured on; it would, in most cases, be too perilous to the assailants, who more frequently conquer by cannon and musketry. Boarding is, in most instances, attempted by privateers against merchantmen, where the defenders are few in number. The assailant well considers all the circumstances for and against him—the relative sizes of the two vessels, the relative strength of the crews, the state of the wind and sea, and the chances of escape if foiled. Besides the pistols, cutlasses, and boarding-pikes of the seamen, there are provided powder-flasks for producing smoke and confusion on the enemy's deck, and shells called stink-pots, for producing an intolerable stench. The moment and the spot being selected, the fuses of the flasks and stink-pots are lighted; these combustibles are thrown upon the enemy's deck; and while the fire, smoke, and stench are doing their work by confusing the enemy, the boarders climb on board, and gain a mastery by their personal prowess—that is, if the calculations of relative strength have been duly made. Sometimes terrible hand-to-hand encounters take place on deck before victory decides for or against the assailants.

General sir Howard Douglas, in his able work on *Warfare with Steam*, expresses an opinion that steam war-ships are likely sometimes to come to close quarters; and that, on that account, they should be provided with a larger quota of marines and of boarding-implements than have hitherto been supplied to sailing ships. The defenders, he adds, should construct loopholed barricades across the terminations of the quarter-deck and the forecastle, to prolong the defense within board. The French naval officers, it is known, look forward to a great increase in all such military resources on board war-steamers; and sir Howard endeavors to impress similar convictions on the English authorities.

BOARDMAN, GEORGE DANA, 1801-31, b. Maine; educated at Waterville college, where he was chosen tutor. In 1823, he offered to become a missionary under the Baptist board of foreign missions, and having studied at Andover theological seminary, was ordained in 1825, and in the same year sailed for Calcutta. He established a mission at Maulmain in 1827, which soon became the most important station under the board. For three years he labored incessantly with unabating zeal and accomplished an immense amount of work, till his course was cut short by death.

BOARDMAN, GEORGE DANA, D.D., son of George Dana, b. in Burmah, 1828; graduate of Brown university and Newton theological institution; ordained in South Carolina, but became pastor first in Rochester, N.Y., whence he went to the First Baptist church in Philadelphia, where he still remains (1880). He has traveled in the east and in Europe, and has delivered courses of lectures in Philadelphia which have drawn great week-day audiences.

BOARD OF ADMIRALTY, a government department which has the management of all matters concerning the British navy. In the article ADMIRAL, the steps are noticed by which the duties of the lord high admiral, in former days, were transferred to a board of commissioners. The constitution and functions of this body will now be described.

The B. of A. comprises five lords commissioners, who decide collectively on all important questions. Besides this collective or corporate action, each has special duties assigned to him. There are two civil or political lords, and three naval or sea lords. The first lord, who is always a cabinet minister, besides a general control, has the management of naval estimates, finance, political affairs, slave-trade prevention, appointments, and promotions. The first naval lord manages the composition and distribution of the fleet, naval discipline, appointment of inferior officers, commissioning ships, general instructions, sailing orders, and the naval reserve. The second naval lord attends to armaments, manning the navy, the coast-guard, the marines, marine artillery, and naval apprentices. The third naval lord has control over the purchase and disposal of stores, victualing-ships, navy medical affairs, transports, convicts, and pensioners. The junior civil lord attends to accounts, mail-packets, Greenwich hospital, naval chaplains, and schools. Naval architecture, the building and repairing of ships, steam-machinery, and new inventions are superintended by the controller of the navy, who is not a member of the board, but is directly responsible to the first lord. Under the lords are the first secretary (parliamentary), the second secretary (permanent), and the naval secretary (professional), who manage the daily office work. The lords all resign when the prime minister resigns, and those who have seats in parliament are replaced by others. This change gives rise to many evils. There is likely to be a change of views and of system: the new board is not bound to act on the plans of its predecessors; and many of the costly novelties in the navy within the last ten years are directly traceable to this cause. The system is defended on the plea that these changes infuse new blood into the admiralty, and give fair-play to increased knowledge and new plans. Some statesmen advocate a modified plan: proposing to render a few naval officers of rank *permanent* lords of the admiralty, and only changing the others on a change of ministry. A connecting-link between the old and new boards is the controller of the navy, who is a permanent officer. The secretaries and the lords determine which letters ought to be submitted to the board collectively; and that portion of the correspondence is treated as in

most boards and committees. All delicate or doubtful matters are specially reserved for the first lord; but in the board meetings he has only one vote, like the rest, though, from his general parliamentary responsibility, he has practically at once an absolute veto and an absolute power of giving action to his views. The admiralty offices are at Whitehall and Spring Gardens, close adjoining.

BOARD OF ORDNANCE, a government department formerly having the management of all affairs relating to the artillery and engineering corps, and to the *matériel* of the British army. Under this precise designation, the board no longer exists; a change having been made which requires brief explanation. The board existed from the time of Henry VIII. until 1855, when it was abolished, its functions being vested in the secretary of state for war as regarded *matériel*, and in the commander-in-chief as concerned the military command of the artillery and engineers. The B. of O., until 1854, comprised the master-general of the ordnance, the surveyor-general, the clerk of the ordnance, and the principal storekeeper, all of whom were usually members of parliament. There was no chairman at the meetings, and the board often consisted of only one officer. The master-general had a veto, and was in that respect more powerful than the chief member of the board of admiralty; although, not having necessarily a seat in the cabinet, he had less political power. The board days were thrice a week; and each of the four members had control over certain departments—the patronage of which was generally vested in him. Scarcely any improvements were made from 1828 till 1854, and the general arrangements were very defective. Of the four members, the master-general, besides his veto, had a general authority; the surveyor-general had control over the artillery, engineers, sappers and miners, ordnance medical corps, contracts, laboratory, gunpowder, barracks, and navy gunners; the clerk of the ordnance managed the estimates, money-arrangements, civil establishment, pensions, superannuations, and ordnance property; while the principal storekeeper had charge of stores, store-rooms, naval equipments, and naval war-stores. In matters relating to coast-defenses, it was often difficult to decide between the admiralty and the ordnance, each board claiming authority. When the Crimean disasters took place in 1854, the defects of the B. of O. became fully apparent: it could not work harmoniously with the other government departments. The board was dissolved, and the office of master-general abolished. By the war office act of 1870, the post of surveyor-general of the ordnance was revived as one of the principal officers of the secretary of state for war. He is responsible for the *matériel* and supplies of the army.

BOARD OF TRADE. See TRADE, BOARD OF.

BOAR-FISH, *Capros*, a genus of fishes of the dory (q.v.) family, or *zeïdæ*, differing from the genus *zeus*, or dory, in the still more protractile mouth—the resemblance of which to the snout of a hog is supposed to have given origin to the name—in the want of spines at the base of the dorsal and anal fins, and of long filaments to the dorsal spines. The body has the usual oval, much compressed form of the family. The common B. (*C. aper*) is a well-known inhabitant of the Mediterranean, rarely caught on the coasts of England. The eyes are very large, and placed far forward; the body is of a carmine color, lighter below, and with seven transverse orange bands on the back. The flesh is little esteemed.

BOAR'S HEAD. The B. H. is the subject of a variety of legends, poetic allusions, and carols connected with the festivities of Christmas in England. At this wintry season, the wild boar was hunted, and his head served up as the most important dish on the baronial table. According to Scott's graphic lines:

> Then was brought in the lusty brawn
> By blue-coated serving-man;
> Then the grim boar's head frowned on high,
> Crested with bays and rosemary.
> Well can the green-garbed ranger tell
> How, when, and where the monster fell;
> What dogs before his death he tore,
> And all the baiting of the boar.

Referring to the article CHRISTMAS for a notice of some of the observances on this occasion, we need here only say that in the "boar's-head carols" are found some of the most interesting specimens of the old English convivial verses. The following, from a carol printed by Wynkin de Worde (1521), may be given;

> *Caput Apri defero*
> *Reddens laudes Domino.*
>
> The boar's head in hand bring I,
> With garland gay and rosemary;
> I pray you all sing merrily
> *Qui estis in convivio.*
>
> The boar's head, I understand,
> Is the chief service in this land;
> Look wherever it be found,
> *Servite cum cantico.*

The boar's head "erased," according to heraldic phraseology, is a well-known cognizance of a number of old families, particularly the Gordons; it also formed the sign of a

tavern at Eastcheap, London, which has been immortalized by Shakespeare. On the site of this famed tavern now stands the statue of William IV.

BOAST (Fr. *ebaucher*), a word in use with sculptors. To B., as its French original implies, is to block out a piece of stone or wood, so as to from a rude approach to the ultimate figure, leaving the smaller details to be worked out afterwards. Ornamental portions of buildings are often inserted in their places in this condition, and frequently remain so if they are in an obscure position.

BOAT is the general name for a small open vessel. Boats differ, however, greatly one from another. They may be slight or strong, sharp or flat-bottomed, decked or undecked, swift for dispatch or roomy for cargo, ornamental for pleasure or plain for hard service, deep or light of draught for deep or shallow water. The chief variety supplied to ships of war are the following—*Long-B.:* The largest B. of a ship, furnished with mast and sails; it is either armed and equipped, to render warlike service in certain situations, or it is employed to fetch water, wood, provisions, and heavy stores on board. *Launch:* longer and more flat-bottomed than the long-B.; being rowed with a greater number of oars, it makes more rapid progress up rivers. *Barge:* a long, narrow, light B., employed in carrying the principal officers to and from the ship; for other kinds of boats or vessels under this name, see BARGE. *Pinnace:* a B. for the accommodarion of the inferior officers; it has usually eight oars, whereas the barge has 10 or more. *Cutter:* broader, deeper, and shorter than the barge or pinnace; it is rowed with six oars, sometimes hoisting a sail, and is chiefly employed in carrying light stores, provisions, and crew. *Jolly-B.:* a smaller cutter, rowed with four oars instead of six. *Yawl:* small in size and used for nearly the same purpose as cutters and jolly boats. *Gig:* a long narrow B., rowed with six or eight oars, and employed by the chief officer on expeditions requiring speed. Some of the above-named boats are diagonal-built for strength; the others are clinch-built, to be as light as possible. The largest ships of war carry boats of all these various kinds, varying in weight from 110 cwt. down to 10 cwt.; the smaller ships carry fewer; while merchant-ships have seldom more than three—except passenger-ships, which are bound by law to carry boats enough to save all the passengers and crew in case of disaster. There are other kinds of boats which do not belong to ships. See BOATING.

In reference to the legal regulation of boats in the merchant service, the following are the chief provisions: When a B. belongs to any ship or other vessel, the name of the vessel and of the place to which she belongs must be painted on the outside of the stern of the B., and the master's name within side the transom—the letters to be white or yellow on a black ground. Boats not belonging to ships or other vessels must be inscribed with the name of the owners and the port to which they belong. All boats having double sides or bottoms, or any secret places adapted for the concealment of goods, are liable to forfeiture.

The boats intended for the rescue of shipwrecked persons, or crews and passengers exposed to that danger, are described under LIFE-BOAT.

BOATBILL, *Cancroma cochlearia*, a bird of the heron (q.v.) family, the only known species of a genus differing from the true herons in little else than the form of the bill, which is comparatively short, and very broad, the mandibles resembling the bowls of two spoons placed one upon the other, the upper mandible overlapping the lower, keeled on its upper ridge, and hooked at the point. The B. is about the size of a domestic fowl, has shorter limbs than most of the herons, but resembles them in plumage, and is abundantly provided with elongated feathers on the back of the head and neck, which it erects when irritated. Its general color is rusty red, the forehead and breast whitish. It inhabits Cayenne, Surinam, Brazil, etc., sits perched upon trees which hang over streams, and darts down upon fish, which seem to be its principal food.

BOAT-FLY, *Notonecta*, a genus of insect of the order *hemiptera* (q.v.), suborder, *heteroptera*, and of the family of the *hydrocorisæ*, or water-bugs (q.v.). All of them, like the rest of the family, are aquatic insects. Their English name is derived from their boat-like form, eminently adapted for progression in water, and probably also from their remarkable habit of always swimming on their back—peculiar to the genus *notonecta*, as restricted by recent entomologists—and of resting in this posture suspended at the surface of the water. The known species of this genus are not numerous. One of them, *N. glauca* (sometimes called the *water boatman*), is common in Britain: it is about half an inch long, and varies considerably in color; but exhibits a general greenish tinge, the other colors being black, brown, and gray. They fly well, but seldom use their wings. They move with difficulty on dry ground. When they descend into the water, they carry down a supply of air for respiration in a hollow between their folded wings. They feed on animal substances, and often kill and devour those of their own species.

BOATING, the art of managing and propelling a boat. This is done either by means of oars or sails. As sailing is fully treated under the head of YACHT, rowing only is dealt with here. The most ancient form of boat known to have been used in the British islands is the coracle; it is still much used in Wales. The *coracle* is but a large wicker-work basket, covered with skins, or some thin water-proof substance stretched over the wicker-work, strengthened by a cross seat. Seated in one of these rude boats, with but a single paddle, it is astonishing with what dexterity the paddler will skim over broken

water, and avoid dangers which would infallibly destroy a heavier or less manageable craft. From the coracle spring all the varied classes of boats now in use, either as pendants to ships, or as used for pleasure traffic or a means of conveyance upon our rivers and inland waters. The *wherry* next claims attention. There are many kinds of wherries, but we only notice the Thames wherry. This is stoutly built, and is constructed to carry about eight passengers. It is usually managed by one sculler or two oarsmen; it is almost entirely employed by watermen for the conveyance of passengers or pleasure-parties. The boats used for rowing as a sport or pastime are of a much lighter and sharper build. They are constructed of all sizes, to carry from twelve oarsmen down to a single sculler. Of this class of boats for racing purposes, we have the 8, 6, 4, 2, and single pair oared boats; while in contests between single scullers, we have what is denominated the *wager-boat*—a boat so frail and light in its proportions, that none but a most experienced sculler can sit in one without danger of upsetting. For pleasure, we have another class of boats denominated *gigs*, of stouter and more capacious build; they are constructed either for four oars, a pair of oars, or single sculls. Boat-racing is a practice of some antiquity, but it has only culminated in our day. Many prizes have been given from time to time for competition, some of which have been made annual. Perhaps the most famous of all these is Dogget's coat and badge, which is rowed for yearly on the Thames by watermen's apprentices, on the 1st of Aug. But the events of most note in the rowing world are the Oxford and Cambridge 8-oared match, rowed annually upon the Thames, from Putney to Mortlake. This match has not been a regular yearly match, there having been occasional intervals at times of a year or two. In 1829, 1842, 1849, 1852, 1854, 1857, 1859, from 1861 to 1869 inclusive, and in 1875, the Oxford boat carried off the prize; Cambridge having wrested it from Oxford in the years 1836, 1839, 1840, 1841, 1845, 1846, 1849, 1856, 1858, 1860, 1870–1874, and 1876. Thirty-three matches have come off in 48 years, the balance being on the side of Oxford. It will be noticed that two matches were rowed in 1849. The best picked men from each university are selected to contest this great event, and the hardest exercise and the severest training gone through by the crews, to improve their wind, strength, and endurance, for months before the day of rowing; their diet consisting mainly of the plainest cooked lean meat and potatoes, with malt liquors, spirituous drinks being prohibited, and the duties of temperance, soberness, and chastity strictly enforced. It was at one time thought that light men stood the best chance in these matches, but experience has shown this to be an error, and 10, 11, and 12 stone men are now chiefly selected. The distance rowed upon this course is 4¼ miles. The time chosen is usually at slack-tide, and the time taken in rowing varies according as there is little or no tide or wind, or the reverse, from 18 to 26 minutes. The introduction of sliding-seats has added very greatly to the power of the rower by lengthening the stroke. The sliding-seat is a small piece of board on which the rower sits, and which works on rollers, and slides backwards and forwards as the rower makes his stroke. From 36 to 44 strokes of the oar per minute is held to be fair racing-pace; and a long, steady, even stroke—the blade of the oar not being dipped too deeply in the water, or thrown too high above the surface when withdrawn, the arms being well extended in taking the stroke, and the elbows brought well home to the sides at the conclusion—is the kind of stroke now preferred by connoisseurs. The other great events of the boat-racing world are the regattas of Henley and Putney. At the former, the Oxford and Cambridge crews usually fight their battle over again in conjunction with others for the challenge-cup; and at these also many scullers' matches are rowed, though single scullers' races for the championship of the Thames, etc., are usually events of themselves. Campbell was one of the first sculling champions, beating Williams in 1831. He was beaten by Robert Coombes in 1846, who held the championship for about six years. He at length succumbed to the prowess of Cole in 1852. Cole, in 1854, was beaten by Messenger; Messenger yielded the palm to Kelly in 1856; and Kelly was, in 1859, beaten by Robert Chambers, the champion of the Tyne. In 1865, Kelly recovered his laurels, and beat Chambers. In 1867, he beat him also on the Tyne; and in 1868, he had in turn to yield to Renforth, having been champion off and on for 12 years. An Australian oarsman, named Trickett, won the championship in 1876, by beating Sadler, then champion. So much is B. favored at our universities and schools, that almost every college has its club.

BOAT-LOWERING APPARATUS is the name given to certain ropes and pulleys for lowering boats from ships quickly and safely, in case of emergency. Every passenger ship is compelled by law to carry a certain number of boats, depending on the tonnage; and every ship of war necessarily carries boats (see BOAT) for minor services; but until recent years the apparatus was very inefficient for lowering these boats from the davits or cranes by which they are usually suspended. In shipwreck or other emergencies at sea, the boats were, until recent years, often so difficult to extricate that they could not be lowered in time to save the crew and passengers; or in lowering they capsized, and plunged the unhappy persons into the sea. Many inventors have recently directed their ingenuity to this subject, with a hope of devising a remedy. In Lacon's apparatus, the principal feature is the employment of a friction-brake, by which one man can regulate the rate of descent to varying degrees of speed. Capt. Kynaston's *disengaging hooks* are intended not only to lower boats quickly and safely when suspended over the side of the

ship, but also to hoist them out quickly when they happen to be stowed in-board. Wood and Rogers's apparatus resembles Kynaston's in this: that the actual lowering from the ship is effected by the crew on shipboard, leaving to the person or persons in the boat only the duty of disengaging it from the tackle. But the apparatus which now engages most attention is Clifford's, the leading principle of which is, that the lowering and the disengaging are both effected by one man seated in the boat. Two ropes or lowering pendants descend from two davits, pass through blocks or sheaves, then through other blocks, within and near the keel of the boat; and finally, round a roller, placed horizontally beneath the seat on which the manager of the boat takes his place. By means of a winding rope, held in one hand, he can regulate the speed with which the other two ropes uncoil themselves from the roller, thus graduating the boat's descent to the water's level. When lowered, the two ropes can be thrown off and the boat set free. The slings or lifts are intended to prevent the canting or upsetting of the boat. The lanyard belongs to the lashings which hold the boat to the side of the ship; but by the thimbles slipping off the prongs the boat is liberated. The efficiency of the apparatus is most remarkable. In 1856, by order of the admiralty, experiments were made with the starboard-cutter of H.M.S. *Princess Royal*. Twelve men got into the boat while it was hanging from the davits; it weighed, with the crew and the gear, nearly 3 tons; nevertheless, this cutter, thus laden, was successfully and quickly lowered by one of the 12 men, to a depth of 40 ft. from the davits to the water. Many other experiments of similar kind were made. Clifford's apparatus is now supplied to many ships of war and merchant-vessels; and many lives have been saved by its means, under circumstances which would almost certainly have proved fatal under the old mode of lowering boats from the davits.

Other systems have since been partially adopted; but none has yet been found which is wholly satisfactory to naval men.

BOATSWAIN is a warrant-officer on board her majesty's ships, who has charge of the boats, sails, rigging, cables, anchors, flags, and cordage. He is immediately under the master in some of these duties; he frequently examines the masts and yards, sails and ropes, to report on their condition and efficiency. He also keeps account of all the spare rigging, etc., and superintends the replacement of old by new. The B. has certain duties in connection with the crew: he assists in the necessary business of the ship, and in relieving the watch. In bad weather, he looks well to the boats and anchors, especially when night is coming on. A B. should be a good sailor, a good rigger, and a vigilant, sober, firm man.

The *boatswain's mate* assists in all the above-named duties; and to him is assigned the repulsive, though now, happily, very rare office of inflicting the flogging awarded to very serious offenses.

BOBADILLA, FRANCISCO DE, d. 1502; Spanish governor of San Domingo, who was sent from Spain in 1500 to investigate charges of maladministration against Columbus. He arrested the discoverer and sent him in chains to Spain; but the act was disowned by the king, and Columbus was restored and sent back, arriving on the day that B., who had been recalled, sailed for Spain. The fleet was wrecked and B. was drowned. But for his treatment of Columbus this vain and tyrannical man would not have been known in history. Probably Ben Jonson's "Capt. Bobadil," the silly braggart in *Every Man in his Humor*, was suggested by this knight of Calatrava.

BOBBIN-NET is the name of a kind of net-fabric, usually made of cotton-thread. It is of the nature of lace, but is made in the lace-frame instead of by hand. The texture is peculiar: it consists in the interlacing of a set of long threads, representing the warp in common weaving, with a set of cross ones (the weft), in such a manner as to form a mesh-texture. B. is one of the most elegant of textile fabrics, and forms an extensive branch of business, the chief seat of the manufacture in this country being Nottingham. See LACE MANUFACTURE.

BOBBINS are small wooden rollers, flanged at the ends, and bored through the center lengthwise, so that they can be placed on a spindle or skewer. The bobbin on which ordinary sewing-thread is wound, although generally of small size, is a good example of their prevailing shape. One or two kinds are, however, of a different type; thus the bobbin, called in Scotland pirn, for delivering the weft from the shuttle, is simply a tapered pin, bored, it may be, throughout, with but the rudiments of a flange at the thick end; and the bobbin used for a similar purpose in lace-weaving, is merely a thin metal pulley, about the size of a halfpenny. For the machines used in the various spinning processes of the textile industries—namely, the slubbing, the roving, the drawing, and spinning frames, bobbins of various sizes, and in enormous numbers, are required. Some of these are 15 in. long by 5 in. in diameter, and diminish in size for each succeeding process, those for the spun-yarn being scarcely larger than a good-sized thread-bobbin. There are also winding and warping bobbins for the weaving processes. For some purposes paper tubes have of late years superseded bobbins.

We are so familiar with the neat and convenient thread-bobbin, now seen in every house, that we are apt to think it a very old invention. Yet people are still living who can remember when all the sewing-thread used for domestic purposes was wound in the form of balls.

In the making of thread-bobbins, ingenious automatic machinery is now employed.

Transverse slices of common birch, the wood chiefly used for these, are first cut to the length of the bobbins. From each of these a number of circular bobbin blanks are next cut out by an annular saw, a hole being drilled through the center of each at the same time. These blanks are then fed into a self-acting turning-machine, operating with a compound cutting tool, whose form is the reverse of the profile of the bobbin. One of these machines produces from 80 to 100 gross of bobbins per day, while an expert hand-turner could not produce more than eight gross in the same time. As most of the bobbins required for spinning purposes are larger than those required for thread, they are made by turning the barrels and ends separately, and then gluing them together, in order to save wood.

Bobbins are made of various kinds of wood, but principally of birch, beech, ash, and plane tree. Sometimes two kinds are used in the same bobbin; and for some special purposes, bobbins are made entirely of metal, such as iron or tinplate. Of late years, some bobbin manufactories have been erected in the highlands of Scotland, in neighborhoods where birch is plentiful. When we consider that there are now about 40 millions of spindles in the spinning-mills of Great Britain, we get some idea of the prodigious number of bobbins constantly wanted to suyply the tear and wear of those used in the spinning processes. One or two of the larger bobbin manufacturers in England employ about 300 hands.

BOBBIO, a t. in Northern Italy, in the province of Pavia, is situated near the left bank of the Trebbia, about 37 m. n.e. of Genoa. B. is an ancient place, having originated from a church and convent erected here in the end of the 6th, or beginning of the 7th c., in the crypt of which St. Columbanus and some of his disciples lie buried. B. has a cathedral, an episcopal palace, and a palace belonging to the Malaspina family. It is guarded from the inundations of the Pellice by a long embankment, built by a money-grant from Oliver Cromwell, during whose protectorate the town was nearly destroyed by an inundation. Pop. about 4000.

BO'BIA, or PIRATE ISLE, a singular island in the bay of Amboise, off the coast of Guinea, Africa. Originally of considerable size, it has been greatly reduced by the action of the waves, and the same agency is still gradually lessening it. It is difficult of access, on account of the precipitous character of its shores, but is said to be densely peopled.

BOB-O-LINK, or BOBLINK, REED BIRD, or RICE BIRD, *Dolichonyx oryzivorus*, a bird nearly allied to buntings and sparrows, but of a genus characterized by stiff-pointed tail-feathers. It is rather larger than a yellow-hammer; and the male in his summer or nuptial plumage exhibits a fine contrast of colors, black, yellow, and white. The female differs greatly from the male in colors of plumage, yellowish-brown chiefly prevailing; and in the latter part of summer, the males assume the comparatively dull hues of the females. The B. is a bird of passage, spending the winter in the West Indies. In summer it is found as far north as the banks of the Saskatchewan, in lat. 54°, but is most plentiful in the Atlantic states and other eastern parts of America, where it is to be seen in every meadow and cornfield. It renders good service by the destruction of insects and their larvæ; but the immense flocks which congregate on their return southwards in autumn, commit great ravages in the rice-plantations of Carolina. At this season, these birds become extremely fat, and are killed in great numbers for the table. Their flesh is delicate, and resembles that of the ortolan.

The B. generally makes its nest in a grassy meadow, an artless structure of a few dry stalks and leaves, with a lining of finer grass. It displays the same instinct with many other birds, of seeking to lead intruders away from its nest, by pretending great anxiety about some other part of the field. During the breeding-season, the males are very musical, singing mostly in the air, in which they seem to rise and fall in successive jerks. Their song is very pleasing, and is "emitted with a volubility bordering on the burlesque." On account of their beauty and powers of song, many are caught, caged, and sold in the New York and other markets.

BOBRUISK, a fortified t. of Russia, in the government of Minsk, and 88 m. s.e. of the city of that name. It is situated on the right bank of the Beresina, and is a station for the steam-packets navigating the Dnieper and Beresina. It was besieged ineffectually by the French in 1812. Pop. '67, 24,681.

BOB-STAY, in the rigging of a ship, is a rope used to confine the bowsprit down to the stem or cut-water: its purpose is to keep the bowsprit steady, by counteracting the force of the stays of the foremast, which draw it upwards.

BO'CA (Span. meaning *mouth*), a term applied to the entrance of various straits and rivers, chiefly in America.—1. B. *Chica*, the channel of 28 m. in length, which leads to Cartagena in New Granada.—2. B. *de Navios*, the largest and most southerly outlet of the Orinoco.—3. B. *Grande*, a bay of the Caribbean sea, at the mouth of the Zucar, in Costa Rica.—4. B. *del Toro*, on the Caribbean sea, in Costa Rica, in lat. 9° 20′ n., and long. 82° west.

BOC'CA TI'GRIS, or BOGUE, the name given to that portion of the estuary of the Canton river (q.v.) extending n. from lat. 22° 45′ n.; s. of this point, the estuary is designated the "outer waters." In the center of the B. T. are the rocky islands of North

and South Wantung, while on the e. the B. T. has the islands of Anunghoy and Chuenpee, and on the w. the Ty-cock-tow island. On these islands are situated the Bogue forts, which have been more than once captured by the British. The last time they were taken was in Nov., 1856, the occasion of quarrel being the refusal of the Chinese to make proper reparation for the capture of a vessel under British protection, but alleged, on the other hand, to be nothing but a smuggling craft, contriving to hide its real character by hoisting the British flag.

BOCCAC'CIO, GIOVANNI, the celebrated author of the *Decamerone*, was b. in Paris, 1313. He styled himself *Da Certaldo*, and was sometimes named *Il Certaldese* by others, because his family sprang from Certaldo, a village in the Florentine territory. From an early period he displayed an invincible attachment to poetry, which his father attempted in various ways to thwart; but, as soon as B. had attained his majority, he commenced to follow vigorously his own inclinations, poetizing both in the Italian and Latin tongues, but not with any "fine issues." In prose, he succeeded far better, developing quickly that airy grace of style which suits so admirably his light and lively tales, and which soon placed him in the highest rank of Italian prose-writers. He studied Dante closely, but did not confine himself to literature properly so called. In 1350, B. formed an intimate friendship with Petrarch, and, following his friend's example, collected many books and copied rare MSS., which he could not afford to buy. It is said that he was the first Italian who ever procured from Greece a copy of the *Iliad* and the *Odyssey*. He also wrote a *Genealogy of the Gods*, in 15 books, which was unquestionably the most comprehensive mythological work that Europe had as yet seen. But not only was B. one of the most learned men of his time, he was also one of the most enlightened in his scholarship. He helped to give a freer direction and a greater expansiveness to knowledge, stimulated his contemporaries to the study of Greek, and wished to substitute the wisdom of antiquity for the unprofitable scholasticism that prevailed.

While in Naples (1341), B. fell passionately in love with a young lady who was generally supposed to be an illegitimate daughter of king Robert. His passion was returned, and, to gratify his mistress, B. wrote *Il Filocopo*, a prose-romance, and afterwards *La Teseide*, the first attempt at romantic epic poetry, and written in *ottava rima*, of which B. may be considered the inventor. In 1342, he returned to Florence, but in 1344 went back to Naples, where he wrote his *Amorosa Fiammetta*, *Il Filostrato*, and *L'Amorosa Visione*. Here, also, he composed his famous *Decamerone*, to please Joanna, the daughter and successor of king Robert. It consists of 100 stories, 10 of which are told each day by 7 ladies and 3 gentlemen, who had fled from Florence during the frightful plague of 1348, to a country villa, and who try to banish fear by abandoning every moment to delicious gayety. It is impossible to exaggerate the literary merits of the book. In abundance of incident especially, it is almost inexhaustible, though many of the stories are taken from older collections of *Contes et Fabliaux*. It is, however, unfortunately steeped in impurity. B. once more returned to Florence about 1350. He was now honored with several diplomatic appointments by his fellow-citizens, and subsequently even thought of entering into holy orders as a penance for the immoral life he had previously led. From this artificial course of repentance he was wisely dissuaded by Petrarch, who advised him to be content with changing his conduct. In 1373, B. was appointed Dantean professor at Florence; that is to say, he was to deliver elucidatory lectures on the *Divina Commedia* of the great poet, and zealously devoted himself to the difficult task thus imposed on him; but, his health failing, he resigned the office, and retired to his little property at Certaldo, where he died, Dec. 21, 1375, 16 months after his friend Petrarch. Besides those works we have already mentioned, B. wrote *Origine, Vita e Costumi di Dante Alighieri*, and *Commento sopra la Commedia di Dante*. This commentary on the Divine Comedy extends only to the 17th canto of the *Inferno*. In Latin, B. wrote, besides the *Genealogia Deorum*, a work arranged in alphabetical order, *De Montibus, Silvis, Fontibus, Lacubus, Fluminibus*, etc.; *De Casibus Virorum et Fœminarum Illustrium; De Claris Mulieribus*, etc.

BOCCAGE, MARIE ANNE FIQUET DU, a French poetess, was b. at Rouen, 22d Oct., 1710, and received her education in the monastery of the Assumption at Paris, where her poetic tendencies early developed themselves, though only furtively. She first appeared as an authoress in a small volume of poems, published in 1746; next as an imitator of Milton in her *Paradis Terrestre* (1748); and, in 1756, issued her most important work, *La Colombiade*. The letters which she addressed to her sister, Madame Duperron, while traveling through England, Holland, and Italy, are the most interesting things which have fallen from her pen. During her life, she was excessively admired and bepraised, especially by Voltaire, Fontenelle, and Clairaut. She used to be described as *Formâ Venus, arte Minerva!* The complimentary poems addressed to her would, if collected, fill many volumes. She was elected member of the academies of Rome, Bologna, Padua, Lyon, and Rouen. She died 8th Aug., 1802. Her poems fail now to explain the reputation she once enjoyed, and dispose us to believe that her personal attractions must have given a charm to her verses.

BOCCALI'NI, TRAJANO, 1556–1613; an Italian satirist. Under the favor of Gregory XIII. he held several offices, the most important being that of governor of Benevento.

His most important work is *Ragguagli di Parnaso*, in which Apollo is represented as receiving the compliments of all who present themselves, and distributing justice according to the merits of each case. The book is full of light fantastic satire. The only government that escapes his attacks is that of Venice, a city for which he had a special affection. Other works of his were the *Pietra*, and commentaries on Tacitus.

BOCHART, SAMUEL, a learned Protestant divine, was b. of an ancient family at Rouen, in 1599. He very early exhibited remarkable talent, chiefly philological. After studying at Paris, Sedan, and Saumur, visiting England in 1621, and finishing his education at Leyden, he was chosen pastor of the Protestant church at Caen, where he became very popular. In 1629, he gained great reputation by his victory, in a public discussion of several days' duration, over the famous Jesuit, Dr. Verin. The meetings gained additional éclat from the occasional presence of the viceroy of Normandy, the duke of Longueville. In 1646, appeared his sacred geography, bearing the title of *Phaleg* and *Canaan*. His *Hierozoicon*, or Scripture zoology, to which he devoted many years of his life, appeared posthumously in 1675. In 1652, B. was invited to Stockholm by queen Christina, and went thither accompanied by his friend Huet. The court-life, however, did not suit him, and his visit was short. He died suddenly, in 1667, while speaking at a meeting of the Caen academy of antiquaries. A complete edition of his works, with a life by Morin, was published at Leyden in 1712; and a new improved edition of the *Hierozoicon*, his most valuable work, at Leipsic, in 3 vols. 4to (1793–96), by Rosenmüller.

BOCHNIA, a t. of Austrian Galicia, capital of a circle of the same name, and about 25 m. e.s.e. of Cracow. The houses are built chiefly of wood. There are extensive mines of rock-salt in its vicinity, which employ upwards of 500 miners, and yield annually about 13,000 tons of salt. Pop. '69, 8040.

BOCHOLD, or BOCHOLT, a t. in the province of Westphalia, Prussia, on the Aa, 44 m. w.s.w. of Munster. In the neighborhood is a large iron mine. Pop. '71, 6125.

BOCHUM, a chief t. in Westphalia, government of Arnsberg, noted for manufactures of cassimeres, woolens, carpets, hardware, and steel, and considerable trade in grain. Coal-mines are also worked. Pop. '71, 21,192.

BOCK, KARL ERNST, b. Leipsic, 1809; graduate of the university there. He devoted himself to medicine and anatomy, and became professor in the university and director of the clinical department. He is the author of a number of important anatomical works, an atlas of anatomy, etc.

BOCKENHEIM, a manufacturing t. in Germany, 1 m. from Frankfort, on the Main and Weser railroad; pop. '71, 8476.

BÖCKH, AUGUSTUS, the most erudite classical antiquary of Germany in recent times, was b. Nov. 24th, 1785, at Carlsruhe, and entered the university of Halle in 1803. The prelections of Wolf determined him to the science of philology. His first publication was *Commentatio in Platonis qui vulgo fertur Minoem* (Halle, 1806). In 1808, appeared his *Græcæ Tragœdiæ Principum, Æschyli, Sophoclis, Euripidis, num ea quæ supersunt et genuina omnia sint*. In 1809, he became ordinary professor of the university of Heidelberg; and in 1811, he was translated to the chair of rhetoric and ancient literature, at Berlin, where he taught for upwards of 40 years, forming many excellent scholars, and extending his reputation through all the learned circles of Europe. His conception of philology as an organically constructed whole, which aims at nothing short of an intellectual reproduction of antiquity, excited for a long time great opposition among his professional contemporaries, but it undoubtedly gave an impetus to a deeper study of the old classical world. His lectures include not merely a grammatico-historical interpretation of the ancient authors, but also archæology proper, the history of ancient literature, philosophy, politics, religion, and social life. The four great works of B. which have, in fact, opened up new paths in the study of antiquity, are, first, his edition of Pindar (2 vols., Leip. 1811–22), in which the meter and rhythm of the poet, as well as his artistic skill, are investigated and discussed with profound knowledge of the subject. 2d, *The Political Economy of Athens* (2 vols., Berlin, 1817), a work which remains unsurpassed for subtle research, surprising results, and clear exposition. It treats of the prices of goods, rate of workmen's wages, rent of houses and land, and other points of commercial economy, as well as of the larger questions of the state income and expenditure. It has been translated into English by Sir George Cornewall Lewis, under the title of *The Public Economy of Athens* (Lond. 2d edit. revised, 1842). 3d, *Investigations concerning the Weights, Coins, and Measures of Antiquity* (Berl. 1838). 4th, *Records of the Maritime Affairs of Attica* (Berl. 1840). The most important of his lesser works are the *Development of the Doctrines of Philolaus, the Pythagorean*, his edition of the *Antigone* of Sophocles, and a *Dissertation on the Silver Mines of Laurion in Attica*. B. has also the honor of having commenced, in 1824, the great work entitled *Corpus Inscriptionum Græcarum*, published at the expense of the royal academy of Berlin, which was afterwards continued first by Franz, and then by Kirchhoff. In 1852, appeared his *Researches on the Cosmical System of Plato;* in 1855, *The Lunar Cycles of the Greeks;* and, in 1863, *On the Four-year Solar Cycles of the Ancients*. He died in 1867.

BOCKLAND, BOCLAND, or BOOKLAND, one of the original modes of tenure of manor-land, also called charter-land, or deed-land, which was held by a short and simple deed under certain rents and free services. It was land that had been severed by an act of government from the *Folcland* (q.v.), and converted into an estate of perpetual inheritance. It might belong to the church, to the king, or to a subject; it might be alienable and divisible at the will of the proprietor; it might be limited in its descent, without any power of alienation in the possessor. It was often granted for a single life or for more lives than one, with remainder in perpetuity to the church. It was forfeited for various delinquencies to the state.

The estate of the higher nobility consisted chiefly of bockland. Bishops and abbots might have B. of their own, in addition to what they held in right of the church. The Anglo-Saxon kings had private estates of B., and these estates did not merge in the crown, but were devisable by will, gift, or sale, and transmissible by inheritance, in the same manner as B. by a subject. (Kerr's *Blackstone*, vol. ii. p. 88; *An Inquiry into the Rise and Growth of the Royal Prerogative in England*, by John Allen, pp. 143–151; Wharton's *Law Dictionary*, 2d ed., under *Bockland*.)

BÖCKLIN, ARNOLD, b. 1827; a Swiss painter; a professor of landscape painting in Weimar academy in 1860–62. He is noted for success in ideal scenery, and among his pictures are "Amazons Hunting in a Forest," "A Panic," etc.

BODE, THE BARONS DE, a family of doubtful nationality, best known in England in connection with a claim for indemnity frequently brought before parliament. The first member of the family connected with England was CHARLES A. L. F. DE B., a baron of the Holy Roman empire. He was born at Neuhof, in Germany, in 1741, and became an officer in the regiment of Nassau, which, although in the service of France, consisted exclusively of Germans. The baron had landed property in Germany, and remained German when he married a Miss Kennersley, an Englishwoman. Two years afterwards, a son was born of the marriage at Locksley, in Staffordshire, named CLEMENT J. P. P. de B., who returned when a child with his parents to the continent. In 1787, baron Charles purchased an estate in Lower Alsace, held under German feudal tenures, in terms of the treaty of Münster, and thither he went to reside. The revolution, however, broke out, and in 1791, the baron considered it prudent publicly to surrender his estates to his son. Two years later, the family was obliged to emigrate, and the property was confiscated. After leaving France, baron Charles bought a fief held of the archbishop of Cologne, and he died a German in 1797. Clement, his son, became an officer in the Russian artillery, married a Russian, and, with his regiment, entered Paris in 1814. After the peace, conventions were entered into, under which British residents who had suffered during the revolution by confiscation were to be indemnified. A large sum was handed over by France to England, to be divided among the claimants, one of whom was baron Clement. The fact that he had been invested as proprietor of the estate in Alsace at the time of confiscation, that his mother was English, and that he had been born in England, secured at first a recognition of his claim to the extent of making it an item of the calculation for fixing the amount of the indemnity; but it was afterwards repudiated, on the ground, that baron Clement was not an English subject at the time of confiscation, and that he had sustained no loss through his connection with England. He died in 1846. His son, BARON CLEMENT A. G. P. L., took out letters of administration to his father, and prosecuted the claim of his family; without, however, any success. He petitioned the house of commons in 1852, and his case was fully discussed. See J. Hodgkin's *Case of the Baron de B. in its Present Aspect* (1860). Baron Clement is naturalized as a British subject, and his married an Englishwoman. He has acquired reputation as an eastern traveler, and is the translator of *Bokhara, its Emir and People*, from the Russian of Khanikoff (1845), and the author of *Travels in Lauristan and Arabistan* (1845), and of an interesting *Account of Hilly Daghestan and the Lesghi Tribes of the Eastern Caucasus*, referred to with approbation by earl de Grey in his address to the geographical society in 1860.

BODE, JOHANN ELERT, 1741–1826; an eminent German astronomer. When a boy he made astronomical observations from the garret of his father's house, with a telescope constructed by himself, and at the age of 18 calculated an eclipse of the sun. The next year he wrote on the solar eclipse of Aug. 5, and an elementary treatise on astronomy which was especially successful. In 1774, he commenced the *Astronomical Year-Book*, which is still continued. But his fame rests chiefly on the *Uranographia*, published in 1801, in which he gives observations on 17,240 stars, or 12,000 more than can be found in any previous charts.

Bode reproduced the statement of the relations of the planetary distances, previously made known by Titius of Wittenberg, but afterwards called "Bode's law" It assumes the series of numbers, 0, 3, 6, 12, 24, 48, 96, etc., each term after the second being twice the preceding term; to each term 4 is added, producing the series, 4, 7, 10, 14, 28, 56, 100, etc., whose terms correspond roughly to the distances of the planets from the sun, when stated in 10 millions of miles, thus: Mercury, 3.5; Venus, 6.8; Earth, 9.1; Mars, 13.9; Minor planets, 22–34.9, average 28.4; Jupiter, 47.6; Saturn, 87.2; Uranus, 175.4. Thus far the approximation is tolerably close, but the next terms are far apart. The number of the series is 388, while the corresponding planetary distance is but 274.6.

The "law" needs, first, a demonstration of its causes; second, an explanation of its discrepancies; then it should be called the law of Titius.

BO'DEN-SEE. See CONSTANCE, LAKE OF.

BO'DENSTEDT, FRIEDRICH MARTIN, b. 1819; when young, a private tutor in the family of prince Galitzin. He subsequently traveled in the Crimea, Greece, Asia Minor, and the Caucasus, publishing *The People of the Caucasus*, and *A Thousand and One Days in the East*. After some experience in journalism he became professor in the university of Munich, lecturing on Slavonic languages and literature. In 1851, he published the *Songs of Mirza Schaffy*, supposed to have been translations from the Persian, but really original, which attained remarkable success. He is the author of various other poems, and assisted in German translations of Shakespeare.

BODE'S LAW, an arithmetical relation subsisting between the distances of the planets from the sun. It may be thus stated: Write, in the first instance, a row of fours, and under these place a geometrical series beginning with 3, and increasing by the ratio 2, putting the 3 under the second 4; and by addition we have the series 4, 7, 10, etc., which gives nearly the relative distances of the planets from the sun.

4	4	4	4	4	4	4	4	4
	3	6	12	24	48	96	192	384
4	7	10	16	28	52	100	196	388

Thus, if 10 be taken as the distance of the earth from the sun, 4 will give that of Mercury, 7 that of Venus, and so forth. The actual relative distances are as follow, making 10 the distance of the earth—

Mercury.	Venus.	Earth.	Mars.	Asteroids.	Jupiter.	Saturn.	Uranus.	Neptune.
3.9	7.2	10	15.2	27.4	52	95.4	192	300

Close as is the correspondence between the law and the actual distances, no physical reason has been given to account for it, although there is little room for doubt that such exists. B. L., therefore, in the present state of science, is termed empirical. Kepler was the first to perceive the law, and Bode argued from it that a planet might be found between Mars and Jupiter, to fill up the gap that existed at the time in the series. The discovery of the asteroids has proved the correctness of this prediction. The greatest deviation from the law is seen in the case of Neptune; but if we were acquainted with the principles from which the law proceeds, we might also be able to account for the discrepancy. Similar relations, though expressed in different numbers, are found to subsist in the distances of the satellites of Jupiter and Saturn from their primaries.

BODIN, JEAN, 1530–96; a French lawyer and politician, author of a number of philosophical works. His greatest effort was the *Six Books of the Republic*, the first elaborate attempt in modern times to construct a system of political science. Only four years afterwards, as if to prove that great minds have great weaknesses, he wrote a work expressing the fullest belief in demonology and sorcery. The duke of Alençon gave B. many preferments, and took him with him when he went to London to solicit the hand of queen Elizabeth. B. was much worried between the Protestants and the league, and was accused of being on both sides. That he was disposed to liberality is shown in a posthumous work in the form of a dialogue, in which a Jew, a Mohammedan, a Lutheran, a Zuinglian, a Roman Catholic, an Epicurean, and a Theist take part. The conclusion to which they all come is that they will live together in charity and toleration, and cease from further disputations about religion.

BOD'KIN, an instrument used by women of antiquity to fasten up their hair behind. It was the method commonly adopted by the priests of Cybele, as well as by the female characters in Greek tragedy, the B. being highly ornamented. Silver bodkins are still worn in a similar way by the peasant girls of Naples. The term B. is also applied to a sharp-pointed instrument for piercing holes in cloth, and it was at one time a very common name for a dagger.

BO'DLE, a ancient copper coin in Scotland, in value the sixth of a penny sterling. According to Jamieson, the B. is said to have been so called from a mint-master of the name of *Bothwell*.

BODLEY, Sir THOMAS, the restorer of the library originally established at Oxford by Humphrey, duke of Gloucester, was b. at Exeter, Mar. 2, 1544. His family being forced to flee from England during the persecutions of Mary, settled at Geneva, where B. studied languages and divinity under the most distinguished professors of that city. On the accession of Elizabeth, he returned to England, and completed his studies at Oxford, where he took the degree of M.A., and was afterwards elected a proctor. After traveling some time abroad, he was employed by the queen in diplomatic missions to Denmark, France, and Holland, and returned to his favorite city, Oxford, in 1597, where he devoted himself to literature, especially to the extension of the university library, now called the Bodleyan (q.v.), in B.'s honor. In collecting rare and valuable books from many parts of Europe, B. expended a very large sum, and also left an estate for salaries to officers, repair of the library, and purchase of books. He was knighted by

king James, and died at Oxford, Jan. 28, 1612. B.'s autobiography, extending to the year 1609, together with a collection of his letters, has been published under the title *Reliquiæ Bodleianæ* (Lond. 1703).

BODLEY'AN or BODLEI'AN **LIBRARY**, the public library of Oxford university, restored by sir Thomas Bodley (q.v.) in 1597, his first act being the presentation of a large collection of valuable books, purchased on the continent at an expense of £10,000. Through his influence and noble example, the library was speedily enriched by numerous other important contributions. Among the earliest subsequent benefactors of the B. L., which was opened in 1602, with a well-assorted collection of about 3000 volumes, were the earl of Pembroke, who presented it with 250 volumes of valuable Greek MSS.; sir Thomas Roe; sir Kenelm Digby; and archbishop Laud, who made it a magnificent donation of 1300 MSS. in more than twenty different languages. Upwards of 8000 volumes of the library of the famous John Selden (q.v.) went to the Bodleyan library. Gen. Fairfax presented the library with many MSS., among which was Roger Dodsworth's collection of 160 volumes on English history. During the present century, the most important bequests have been the collections of Richard Gough, on British topography and Saxon and northern literature; of Edmund Malone, the editor of Shakespeare; and of Francis Douce; also a sum of £40,000, by the Rev. Robert Mason, the interest to be expended on books. By purchase, the library acquired some magnificent collections of Oriental, Greek, Latin, and Hebrew books and MSS. The B. L. is particularly rich in biblical codices, rabbinical literature, and materials for British history. By the copyright act, it is entitled to a copy of every book printed in the United Kingdom. The number of volumes it possesses is estimated at about 300,000, in addition to 20,000 to 30,000 in manuscript. The first catalogue of the printed books was published by the first librarian, Dr. James, in 1600; the last, nearly two centuries and a half later (in 1843), in 3 vols., by Dr. Bandinel, the eleventh who held the office since the institution of the library. In the interval, several catalogues of various departments of the library were published; and a supplemental volume was added by Dr. Bandinel in 1850. By statutes drawn up for the government of the library by sir Thomas Bodley, it was decreed that the vice-chancellor, the proctors, and the regius professors of divinity, law, medicine, Hebrew, and Greek, should be visitors and curators; a statute passed in 1856 added "five more residents to be elected by congregation for ten years, if continuing to reside, and to be re-eligible." Members of the university who have taken a degree are admitted to the use of the library—a small addition on the matriculation fees, and an annual payment, being charged for the privilege. Literary men, properly recommended, are allowed to make extracts from the works in the library, which is open between Lady-day and Michaelmas from nine o'clock in the morning till four in the afternoon, and during the other half of the year from ten to three. It is shut during certain holidays, and for visitation purposes, in the aggregate about 34 days in the year, besides Sundays. Since 1856, a reading-room, open throughout the year from ten o'clock in the morning to ten in the evening, has been attached to the library.

BODMANN (ancient *Bodami Castrum*), a village of Baden, at the mouth of the Stockach, on lake Constance, with ruins of a castle, formerly the residence of the lieutenants (*botemann* or *bodmanno*, messenger or *legatus*) of the Carlovingian kings; hence the German name of the lake Bodman-see, or Boden-see. Pop. 900.

BODMER, JOH. JAK., a German poet and *littérateur*, was b. at Greifensee, near Zurich, 19th July, 1698. The study of the Greek and Latin writers, together with the English, French, and Italian masters, having convinced him of the poverty and tastelessness of existing German literature, he resolved to attempt a reformation. Accordingly, in 1721, along with a few other young scholars, he commenced a critical periodical, entitled *Discurse der Maler*, in which the living poets were sharply handled. After 1740, when B. published a treatise on *The Wonderful in Poetry*, a literary war broke out between him and Gottsched, which was long waged with great bitterness; yet it was not without fruits, inasmuch as it partly prepared the way for the Augustan epoch of German literature. B. died at Zurich (in the university of which he had held the chair of history for 50 years), 2d Jan., 1783. As an author, he was marked by inexhaustible activity, but his poems, dramas, and translations have no vigor or originality. His best known production is the *Noachide* (Zurich, 1752). He did greater service to literature by republishing the old German poets, the Minnesingers, and a part of the *Nibelungen*, as also by his numerous critical writings.

BODMIN, the co. t. of Cornwall, in the middle of the county, 26 m. n.n.w. of Plymouth. It is situated partly in a valley and partly on the side of a hill, and consists principally of one street a mile long. Its chief trade is in cattle and sheep. Among the more important recent buildings are a market house, the county jail, and the new Cornwall lunatic asylum. B. arose in a priory founded in the 10th c., and was long an important place, having, besides the priory, a cathedral and 13 churches. The priory was once the property of Thomas Sternhold, one of the translators of the Psalms of David into English meter. Fifteen hundred persons in B. are said to have died of the pestilence in 1351. Pop. '71, 6758. It returns one member to parliament.

BODO'NI, GIAMBATTISTA, a distinguished type-cutter and printer, b. at Saluzzo, in Sardinia, 1740; went to Rome in 1758, where he secured an engagement as compositor

in the printing-office of the propaganda, and where he remained till the death of his patron, Abbate Ruggieri, in 1762, or, according to others, 1766. In 1768, he went to Parma, where he published several specimens of his workmanship; among others—on occasion of the marriage of the prince of Piedmont with the princess Clotilde of France—*Epithalamia Exoticis Linguibus Reddita*, which exhibited the alphabets of 25 languages. In 1789, the duke of Parma made him superintendent of his private printing establishment, and from this press he sent forth his edition of the *Iliad* (3 vols. 1808), dedicated to Napoleon. It is a splendid specimen of typography; but the correctness of the text is by no means equal to the beauty of the printing. His editions of Virgil (2 vols. 1793), and several Greek, Latin, Italian, and French classics, as also his Lord's prayer in 155 languages, are admired for their elegance. He died at Parma, 1813.

BODY, HUMAN, will be treated of under the names of the several organs and functions. For BODY-SNATCHING, see ANATOMY (in law).

BODY COLOR, a term which, in oil painting, is applied to the opaque coloring produced by certain modes of combining and mixing the pigments. When, in water-color painting, pigments are laid on thickly, and mixed with white, to render them opaque, instead of in tints and washes, the works are said to be executed in body color.

BODY OF A CHURCH, more commonly called the *nave* (q.v.), though this latter term is sometimes employed to include the aisle (q.v.), is also known as the main or middle aisle.

BODY'S ISLAND, the sand strip between Roanoke and Albemarle sounds, n. of Oregon inlet, in Dare co., N. C. There is a light on the island, 156 ft. above tide, in 35° 48′ n., and 75° 33′ west.

BOECE, or, more properly, **BOYCE,** HECTOR, a distinguished Scottish historian, was b. of an old family, about 1465, at Dundee. He completed his education at Montague college, in the university of Paris, and in 1497, was appointed a professor of philosophy. Among other learned men whose friendship he here acquired was Erasmus. About the beginning of the 16th c., he was invited by bishop Elphinstone to preside over the university newly founded by him at Aberdeen. B. accepted the office after some natural hesitation, the yearly salary being 40 merks, or about £2 4*s.* 6*d.* sterling. The value of money, however, it has to be remembered, was immensely greater then than now, and the learned principal was at the same time made a canon of the cathedral, and chaplain of St. Ninian. There is every reason to suppose that he discharged his duties with high success. In 1522, he published his lives, in Latin, of the bishops of Mortlach and Aberdeen. This work, a great part of which is occupied with the life of his excellent patron, bishop Elphinstone, was reprinted by the Bannatyne club in 1825. Five years later, B. published the *History of Scotland*, on which his fame chiefly rests, a work which, though proved to contain a large amount of fiction, is worthy of the commendation it has received even on the score of style. The author was rewarded by the king with a pension of £50 Scots, until he should be promoted to a benefice of 100 merks, which appears to have occurred in 1534. B. died two years later.

BŒHME'RIA, a genus of plants of the natural order *urticeæ*, included, until recently, in the genus *urtica*, or nettle (q.v.). The fibers of a number of species are used for making ropes, twine, nets, sewing-thread, and cloth, and some of them appear likely to acquire much economical and commercial importance. *B. nivea* (formerly *urtica nivea*) has been recently ascertained to yield great part of the fiber employed in China in the manufacture of the beautiful fabric known as *China-grass* (q.v.) cloth. It is a perennial herbaceous plant, with broad ovate leaves, which are white and downy beneath, and is destitute of the stinging powers of the nettles. It is carefully cultivated by the Chinese, by whom it is called *tchou ma*. It is propagated either by seeds or by parting the roots. It loves shade and moisture. Three crops are obtained in the season, new shoots springing up after it has been cut. Great attention is bestowed upon the preparation of the fiber; the stems are sometimes tied in little sheaves, and instead of being steeped are placed on the roof of a house, to be moistened by the dew, and dried by the sun, but are carefully preserved from rain, which would blacken them; and in rainy weather they are placed under cover in a current of air. Another plan is to steep the separated fibers for a night in a pan of water, and sometimes they are steeped in water containing the ashes of mulberry-wood. A patent was obtained in Britain, in 1849, for the preparation of this fiber, by boiling the stems in an alkaline solution, after previously steeping them for 24 hours in water of the temperature of 90° F., then thoroughly washing with pure water, and drying in a current of high pressure steam.—It seems now to be ascertained that this is the same plant which Dr. Roxburgh strongly recommended to attention about the beginning of the 19th c. under the name of *urtica tenacissima*, and of which the court of directors of the East India company, in 1816, declared the fiber to be "stronger than Russian hemp of the best description," and to have been "brought to a thread, preferable to the best material in Europe for Brussels lace." It may well be regarded as curious that, after this, it was lost sight of for a considerable time, although the commendation bestowed upon it is found not to have been exaggerated. The plant grows naturally, and is cultivated not only in China but in Sumatra, Siam, Burmah, Assam, and other parts of the east. The fiber is called *caloee* in Sumatra, *ramee* by the

Malays, and *rheea* in Assam.—*B. candicans* and *B. utilis*, from which a fine silky fiber is obtained in Java, are either varieties of this or nearly allied species.—*B. frutescens* is another important species, common in Nepaul, Sikkim, and other parts of the Himalaya, to an elevation of 3000 ft. above the sea. It is not cultivated, but often overruns abandoned fields. It grows to a height of 6 or 8 ft., and varies from the thickness of a quill to that of the thumb. The leaves are serrated, dark-green above, silvery-white below, not stinging. The plant is cut down for use when the seed is formed, the bark is then peeled off, dried in the sun for a few days, boiled with wood ashes for four or five hours, and beaten with a mallet to separate the fibers, which are called *poöah* or *poee*, and also *kienki* or *yenki*. When properly prepared, the fiber is quite equal to the best European flax.—The fibers of a number of coarser species are employed in different parts of the East Indies for making ropes. See Royle's *Fibrous Plants of India*.

BŒHME'RIA. The China grass-plant, *B. nivea*, has been recently introduced into cultivation in some of the southern parts of the United States, under its Malay name of *ramee*. It succeeds well, and the results as to produce of fiber have proved very encouraging.

BŒO'TIA, one of the ancient political divisions of Greece, was bounded on the n. and n.w. by Locris and Phocis, on the e. by the Eubœan channel, on the s. by Attica and Megaris, and on the w. by the Corinthian gulf. B. had a surface estimated at 1120 sq. miles. The plains inclosed on the s. by Mts. Cithæron and Parnes, on the w. by Mt. Helicon, on the n. by the slopes of Mt. Parnassus and the Opuntian Mts., fall naturally into three divisions—the basin of the lake Copais, now called Topolias, that of the Asopus, and the coast-district on the Crissæan sea. The principal stream was anciently called the Cephissus. It entered the country from Phocis at Chæronea; and in the spring, when it was swollen by innumerable torrents, almost converted the Copaic plain into a lake. There were several natural channels for the outlet of the waters that congregated in this plain, but they were not sufficient to carry off the whole surplus, and the surrounding country was in consequence frequently deluged. In order to guard against this inundation, two tunnels had been cut in the rock for the discharge of the water. One of these tunnels which carried the water to Upper Larymna—where it emerged in a natural outlet after a subterraneous course of nearly 4 m., whence it flowed above ground a mile and a half to the sea—was no less than 4 m. in length, with about 20 vertical shafts let down into it, some of which were from 100 to 150 feet deep. The other tunnel, which united the Copais lake with that of Hylica, was much shorter, but still an extensive and striking work. The date of these gigantic engineering undertakings is not precisely known, but they are generally attributed to the Minyæ or Orchomenus. B. was in ancient times very productive of marble, potters' earth, and iron, besides abounding in corn and fruits; and it was also particularly celebrated for flute-reeds. The earliest inhabitants belonged to different races, the two most powerful of which were the Minyæ and Cadmeans or Cadmeones; but were at an early date (about 60 years after the Trojan war, according to Thucydides) in part dislodged by the Bœotians, an Æolian people who were driven from Thessaly, and in part incorporated with them. The Bœotians excelled as cultivators of the soil, and were gallant soldiers both on foot and horseback; but they were rude, unsociable, and took little part in the gradual refinement of manners and intellectual development of the rest of Greece, so that the name became proverbial for illiteral dullness. This was usually ascribed to their thick damp atmosphere. Yet there have not been wanting amongst them eminent generals, as Epaminondas; and poets and historians, as Hesiod, Pindar, Corinna, Plutarch, etc. The greater cities, of which the number was about fourteen, Thebes, Haliartus, Thespiæ, etc., with their territories, formed the Bœotian League. At the head of this was an archon, and next to him a council which was composed of four persons, and had its head-quarters in Thebes. The executive authority was intrusted to Bœotarchs, who were elected in popular assemblies of the separate states, and could only hold office for one year. Of this league, a shadow still remained down to the times of the empire; but after the battle of Chæronea, in which Philip established the Macedonian throne on the ruins of Grecian liberty, the political importance of the country declined so rapidly, that about 30 B.C. only two cities, Tanagra and Thespiæ, were of any consideration.—Along with Attica, B. now forms one of the "nomarchies" of the kingdom of Greece.

BOERHAAVE, HERMANN, the most celebrated physician of the 18th c., was b. at Voorhout, near Leyden, Dec. 13, 1668. In 1682, he went to Leyden, with the intention of becoming a clergyman, and there studied Greek, Latin, Hebrew, Chaldee, history, ecclesiastical and secular, and mathematics. In 1689, B. was made doctor of philosophy, and in 1690 began the study of medicine, reading carefully Hippocrates among the ancients, and Sydenham among the moderns. Though mainly self-educated in medicine —as in chemistry and botany—he gained his doctor's degree at Harderwyck, 1693, and returned to Leyden, where, in 1701, having abandoned theology, he was appointed lecturer on the theory of medicine, and in his inaugural lecture recommended to the students the ancient method of Hippocrates in medicine; but in 1703 his views had become greatly enlarged. He saw the necessity of *a-priori* speculations, as well as of the Hippocratic method of simple observation, and elaborated various mechanical and chemical hypotheses to explain the diseases of the body, especially in the case of the fluids. In 1709, he was elected professor of medicine and botany in the place of Hotton. About this

time, he published the two works on which his great fame chiefly rests: *Institutiones Medicæ in Usus Annuæ Exercitationis Domesticos* (Leyd. 1708), and *Aphorismi de Cognoscendis et Curandis Morbis, in Usum Doctrinæ Medicinæ* (Leyd. 1709), both of which went through numerous editions, and were translated into various European languages, and also into Arabic. In the first work—a model of comprehensive and methodical learning—he gives a complete outline of his system, including a history of the art of medicine, an account of the preliminary knowledge necessary to a physician, and a description of the parts and functions of the body, the signs of health and disease, etc.; in the second, he gives a classification of diseases, with their causes, modes of treatment, etc. B. also rendered important services to botany. One of his best lectures is that delivered on his resignation of the office of rector of the university, *De Comparando Certo in Physicis*. To combine practice with theory, he caused a hospital to be opened, where he gave clinical instructions to his pupils. Though so industrious in his own profession, he undertook, in 1718, after Lemort's death, the professorship of chemistry, and published in 1724 his *Elementa Chemiæ*, a work which did much to render this science clear and intelligible; and although now entirely superseded by more advanced researches, one that will always occupy a high place in the history of chemistry. His fame had meanwhile rapidly increased. Patients from all parts of Europe came to consult him. Peter the great of Russia visited him; and it is even said that a Chinese mandarin sent him a letter, addressed "HERR BOERHAAVE, celebrated physician, Europe." He was a member of most of the learned academies of the day. He died Sept. 23, 1738, having realized from his profession a fortune of two millions of florins.—Burton, *Account of the Life and Writings of B.* (2 vols., Lond. 1743); Johnson, *Life of B.* (Lond. 1834).

BOERHAA'VIA. See NYCTAGINACEÆ.

BOERS (*Dutch*, agriculturists, farmers), the name applied to the Dutch colonists of the cape of Good Hope who are engaged in agriculture and the care of cattle. The B., generally, according to Dr. Livingstone, "are a sober, industrious, and most hospitable body of peasantry." Very different, however, are certain of their numbers who have fled from English law, on various pretexts, and formed themselves into a republic in the Cashan mountains. Coming "with the prestige of white men and deliverers" from the cruelty of Kaffir chiefs, they were received by the Betjuans gladly, who, however, soon found out that their new friends were much less desirable as neighbors than their old enemies. The B. force even those tribes of the Betjuans who are most friendly towards them to perform all kinds of field labor for nothing; and not only this, but they also compel them to find their own implements of labor and their own food. They steal domestic servants from the more hostile tribes in the most cowardly and cold-blooded way imaginable. The plan of operation is thus described by Dr. Livingstone: "One or two friendly tribes are forced to accompany a party of mounted Boers, and these expeditions can be got up only in the winter, when horses may be used without danger of being lost by disease. When they reach the tribe to be attacked, the friendly natives are ranged in front, to form, as they say, "a shield;" the Boers then coolly fire over their heads, till the devoted people flee, and leave cattle, wives, and children to the captors. This was done in nine cases, during my residence in the interior, and on no occasion was a drop of Boer's blood shed." And yet these B. proudly boast themselves "Christian!" They have an immense contempt for the ignorance of the natives, and told Dr. Livingstone that he might as well teach baboons as Africans. They, however, declined a test which the missionary proposed—viz., to be examined whether they or his native attendants could read best. In his opinion, they are quite as degraded as the blacks whom they despise. See ORANGE RIVER FREE STATE.

BOË'THIUS, ANICIUS MANLIUS SEVERINUS (to which a few MSS. add *Torquatus*), a Roman statesman and philosopher, was b. between 470 and 475 A.D. The family to which he belonged had been distinguished both for its wealth and dignity for two centuries. His own father held the office of consul, but dying while B. was still a boy, the latter was brought up under the care of Festus, Symmachus, and other honorable Romans. He studied with sincere enthusiasm philosophy, mathematics, and poetry, translated and elucidated with laborious care the writings of Aristotle, and of the old mathematicians Euclid, Archimedes, Ptolemæus, and others; but the story of his 18 years' stay at Athens is entirely unhistorical. B. soon attracted notice; he became a patrician before the usual age, a consul in 510, and also *princeps senatus*. Having, moreover, gained the esteem and confidence of Theodoric, king of the Goths, who had fixed the seat of his government at Rome in the year 500, he was appointed by that monarch *magister officiorum* in his court. His influence was invariably exercised for the good of Italy, and his countrymen owed it to him that the Gothic rule was so little oppressive. His good fortune culminated in the prosperity of his two sons, who were made consuls in 522. But his bold uprightness of conduct, springing from what seemed to have been the essential characteristics of the man—viz., a strong faith in the truth of his philosophic ethics, and a courage to regulate his official conduct by them—at last brought down upon his head the unscrupulous vengeance of those whom he had checked in their oppressions, and provoked by his virtues. He was accused of treasonable designs against Theodoric; and the king, having become despondent and distrustful in his old age, was induced to listen to the charges. B. was stripped of his dignities, his property was confiscated, and

he himself, after having been imprisoned for some time at Pavia; was executed in 524 or 526; according to one account, with circumstances of horrible cruelty. During his imprisonment, B. wrote his famous *De Consolatione Philosophiæ*, divided into 5 books, and composed in the form of a dialogue, in which B. himself holds a conversation with Philosophy, who shows him the mutability of all earthly fortune, and the insecurity of everything save virtue. The work is composed in a style which happily imitates the best models of the Augustan age, and the frequent fragments of poetry which are interspersed throughout the dialogue are distinguished by their truthfulness of feeling and metrical accuracy. The *Consolatio* is piously *theistic* in its langnage, but affords no indication that B. was a Christian; and if the doctrinal treatises ascribed to him are, as the acutest criticism maintains, not genuine, we must class him in religion rather with Marcus Aurelius than with his alleged friend, St. Benedict. He was the last Roman writer of any mark who understood the Greek language and literature. During the middle ages, he was regarded with profound reverence, as the *Augustine* of philosophy, but on the introduetion of the Aristotelian metaphysics in the 13th c., his reputation gradually sank. The first edition of B.'s entire works appeared at Venice, 1491–92; a more correct one at Basel, 1570. The oldest edition of the *Consolatio* is that published at Nürnberg, 1473, but many manuscript translations into various languages had appeared long before the invention of printing. Among these may be mentioned that by king Alfred into Anglo-Saxon.

BŒUF, Bayou, an overflow stream in Arkansas and Louisiana, fed in time of inundation by the Mississippi. It unites with Washita river, and at high water offers 100 m. of steamboat navigation.

BOG, land covered with peat, the spongy texture of which, containing water, converts it into a kind of quagmire. The term Peat-bog is sometimes employed as more perfectly distinctive of the true B. from every other kind of swamp or morass; the term Peat-moss is also sometimes employed, particularly in Scotland, and even simply Moss. The word B. is of Irish origin, being from a Gael root signifying a bobbing, quaking motion.

Bogs of great extent exist in some of the northern parts of the world. A very considerable part of the surface of Ireland is occupied with them. The B. of Allen (see Allen, Bog of) is the most extensive in the British islands, although its continuity is not altogether unbroken, strips of arable land intersecting it here and there. The Solway moss (q.v.), on the western borders of England and Scotland, is about 7 m. in circumference, Chatmoss (q.v.), in Lancashire, famous for the engineering difficulties which it presented to the formation of the first great English railway, is 12 sq.m. in extent. The swamps of the e. of England are in general not peat-bogs, but consist chiefly of soft mud or silt.

The general surface of a B. is always nearly level, but it is usually varied with rushy tussocks rising above the rest, and having a rather firmer soil. By the continued growth of peat, the surface of a B. is gradually elevated; that of Chatmoss, for example, rises above the level of the surrounding country, having a gradual slope of 30 or 40 ft. from the center to the solid land on all ides. In rainy weather, it sensibly swells, the spongy mass imbibing water, whilst the mosses and other growing plants on the surface prevent evaporation. Occasionally, the quantity of water becoming excessive, a B. *bursts*, and pours a terrible deluge down the course of a stream, causing great devastation, not only by the force of its torrent, but by the enormous quantities of peat which it deposits upon meadows and cultivated fields, as has recently happened in some memorable instances in Ireland. The depth of a B. is sometimes more than 40 feet. The spongy mass of which it is formed shakes on the least pressure. Sometimes it is impossible to traverse it; in other cases, it is possible only for those who are well accustomed to it, a false step being a plunge into a quagmire, in which a man sinks as in a quicksand. Safety is sometimes insured by "pattens"—boards fastened upon the soles of the feet—a method which Mr. Roscoe of Liverpool, in his extensive operations for reclaiming land from Chatmoss, employed also to enable horses to work upon its surface. It was not the least remarkable triumph of the genius of Stephenson, to extend the same principle to the support of the railway. Tradition reports that at the battle of Solway, in 1542, a fugitive troop of horse plunged into the moss, which instantly closed upon them; and in the end of the 18th c., this tradition was confirmed by the discovery, made by peat-digging, of a man and horse in complete armor.

One of the remarkable phenomena of peat-bogs is the frequent presence of roots and fallen trunks of trees, in a good state of preservation, many feet below the surface. From the black bog-oak of Ireland, various small fancy articles are manufactured. The circumstance of trees being found imbedded in bogs, leads to the conclusion that in many instances these morasses originated in the decay or partial destruction of ancient forests. This subject, however, along with all that relates to the origin and nature of bogs, will be treated in the article Peat. It may be proper here to mention that there is a popular division of bogs into two classes—*red bogs* and *black bogs;* the decomposition of the vegetable matter in the former being less perfect, and the substance, consequently, more fibrous and light than in the latter. There is indeed no precise line of distinction, and all intermediate conditions occur. The most extensive bogs are red bogs, and they

are said to cover 1,500,000 acres in Ireland. Black bogs, although comparatively of small extent, are more numerous, particularly in elevated districts, for which reason they are sometimes called *mountain bogs*. The depth of red bogs is usually much greater than that of black bogs.

The conversion of bogs into good pasture or arable land, is a subject of national importance. There can be no doubt that much of the land now occupied by B. is capable of being rendered very productive, whilst the effects of extensive bogs upon the climate are always injurious. The reclaiming of shallow mountain bogs is comparatively easy, and in some cases it is effected by a very simple and inexpensive drainage, and by throwing them at once under cultivation in a manner analogous to that known in Ireland as the *lazy-bed* method of planting potatoes—the soil upon which the B. rests being partially digged up and thrown over its surface. Great difficulties, however, attend the reclaiming of red bogs. It has unfortunately happened, particularly in Ireland, that the tenures of land, and the want of capital on the part of the owners of estates, have formed the most insuperable of all obstacles to improvements of this kind, which, however, have been carried on to no inconsiderable extent since the middle of the 18th c., and have in general proved highly remunerative. A chief difficulty, in some cases, is caused by the low situation of the B., and the want of *fall* for drainage. Another great difficulty is presented by the spongy substance of red bogs being extremely retentive of water, so that a deep ditch only drains a very narrow strip on each side of it. A difficulty has been also found in disposing of the peat, where a good soil being known to exist below, it has been attempted to reclaim land by removing the peat instead of draining it and converting its own surface into soil. To some extent, in such cases, the peat is advantageously disposed of for fuel, or to be used as a species of manure for other soils; but the demand for these purposes is often insufficient for any other than a very slow process of improvement in an extensive B. The peat is, therefore, sometimes, by various means, floated off, as in the long-continued operations at Blair-Drummond, on the banks of the Forth, the results of which have for many years formed a peculiar feature on the shores and in the bays of the upper part of the firth of Forth. But when a similar method was more recently introduced in an extensive moss in the low lands of Renfrewshire, the Clyde trustees interposed to prevent it, in the interests of the navigation of the river. A portion of the peat, taken from the upper surface, is not unfrequently burned in heaps upon the spot, the ashes becoming a manure, and assisting in the formation of a soil.

Of course, the first essential in the reclaiming of bogs is drainage. The method of effecting this must be varied according to circumstances; but very frequently, after a general outlet with sufficient fall has been secured, wide open drains are cut, by which the bog is divided into strips, which again are traversed and subdivided by smaller drains. When these drains begin to serve their purpose, the surface of the bog sinks, and their depth is reduced; they are then often deepened, and at last a permanent system of covered drains emptying themselves into open ditches is thus formed, and fits the land for all the purposes of agriculture. It is, however, often plowed before this state of things is attained, the plow-horses being shod with the *pattens* already mentioned, and socks and coulters of unusual sharpness being employed for the cutting of the bog. Various implements have also been devised for cutting the moss, to facilitate cultivation. Lime, calcareous sand, clay, and other manures are applied, according to circumstances, to promote the conversion of the peat into useful soil. Sometimes the first crop taken from the plowed bog is a crop of oats; sometimes it is found preferable to begin with rape, turnip, or the like. In some places in the north of Ireland, florin grass (see BENT GRASS) has been sown on bogs in process of being reclaimed, and enormous crops have been obtained.—See WASTE LANDS.

BO'GAN, or NEW-YEAR RIVER, the *Allan Water* of Oxley, an interior stream of east Australia, joins the Darling after a generally n.w. course of more than 300 m., about lat. 30° s., and long. 146° east. Its source is in the Harvey range, about lat. 33° s., and long. 148° 30′ east.

BOGARDUS, EVERARDUS, a minister of the early Dutch Reformed church in New Amsterdam. In 1638 he married Anneke Jans, a widow, who owned 60 acres of land in what is now an important business part of New York. The farm subsequently came into possession of Trinity church, and has been the occasion of many law suits for recovery by the heirs of Bogardus; but they are all in vain, the church's title being complete. In 1647, Bogardus sailed for Holland to answer certain charges made by his ecclesiastical superiors, but lost his life by shipwreck in Bristol channel.

BOGARDUS, JAMES, b. New York, 1800; an inventor. Among his notable works are: the eight day, three wheeled, chronometer clock, and several other improvements in time pieces; the ring-flyer for spinning cotton; the eccentric mill, in which both stones run the same way but with different speed; an engraving machine; a transfer machine for producing bank-note plates from separate dies; the first dry gas meter; the first pencil-case without a slot; a medallion engraving machine; a machine for engine-turning; the accepted method for making stamps for penny postage; a machine for pressing glass; several machines for cutting and working India-rubber; a new horse-power; a dynamometer, and other contrivances of less importance. In 1847 he put up for his factory

a cast-iron building, the first one of that material ever erected. Soon afterwards he introduced wrought-iron beams.

BOG BUTTER, a very peculiar mineral substance, which is found in some of the bogs of Ireland. It is evidently of vegetable origin, and has been formed by the decomposition of the peat amidst which it is found. In composition and qualities it exhibits a general agreement with bitumen, asphalt, amber, and the other mineral resins; all of which are not improbably supposed to resemble it also in their origin, although perhaps it is the most recent of them all. It contains about 74 per cent. of carbon; its remaining constituents being oxygen and hydrogen in nearly equal proportions. In color and consistency, it much resembles butter, and at 124° F. it becomes liquid. It is not soluble in water, but is readily dissolved by alcohol.

BOGDANOVITCH, HIPPOLYTUS THEODOROVITCH, a distinguished Russian poet of the 18th c., was b. at Perevolotchna, Little Russia, in Dec., 1743. His fame rests entirely upon his poem, *Dushenka*, published in 1775. The story of Psyche forms the groundwork of the poem, which is characterized by a refined and graceful style, and vivacious playfulness of language. Its publication made him at once famous, as well as obtained for him the high favor of the court; but there can be no doubt that the popularity of the work was as much owing to the adventitious circumstances in which it was produced —nothing of the kind having been previously attempted in Russia—as to its intrinsic merits. B., though he wrote much afterwards, never equaled his first performance. He died in Jan., 1803.

BO'GEN, a t. of Bavaria, in the circle of Lower Bavaria, situated on the left bank of the Danube, about 6 m. e. of Straubing. It has extensive breweries, but is chiefly celebrated for its chapel, still a place of pilgrimage, built on a neighboring height. Here, according to tradition, a hollow stone image of the Virgin floated up by the river, remained stationary; and its miraculous arrival had the effect of converting a notorious robber chief, the ruins of whose castle now inclose the church. Innumerable pilgrims flocked to the image, including, at various times, three German emperors, and the monks grew very wealthy on their offerings. Pop. 1200.

BO'GENHAUSEN, a village in Bavaria, the seat of the royal observatory of Munich, 2 m. n.e. of that city. The observatory, one of the best in the world, is in 48° 8′ n., and 11° 36′ east.

BOGERMANN, JOHANN, who occupies a place in history as president of the far-famed synod of Dort, was b. in 1576, at the village of Oplewert, in Friesland. He took a violent part in the religious controversies which inflamed, with unwonted fire, the Dutch mind at the beginning of the 17th century. His hatred of Arminianism extended itself (as theological hatred generally does) to the persons who upheld it, and his zeal was on various occasions gratified by securing the punishment of those who had the misfortune to differ in opinion from him. He translated and recommended Beza's book on the *Capital Punishment of Heretics;* and about the year 1614, ventured to assail the great Grotius in a polemical treatise, which, along with most of the angry literature of the period, has properly perished. In 1618, B. was elected president of the synod of Dort; but his conduct there does not seem to have given satisfaction to the Frieslanders who had delegated him, for he was accused on his return of having exceeded his instructions. For one thing, however, B. deserves great credit, his translation of the Bible into the vernacular. Four other persons were associated with him in the task, but the translation of the Old Testament is chiefly B.'s work, and is characterized by taste, fidelity, and purity of language. It is still used in the Dutch churches. B. died in 1633, at Franeker, in the university of which he was primarius professor of divinity.

BOGGS, CHARLES STUART, b. N. J., 1811; rear-admiral in the U. S. navy, retired in 1873. He commanded the *Varuna* at the passage of the forts below New Orleans, and was specially praised by Farragut.

BOGHAZ' KIE'UI, KE'WEE, or KOI, a village of Asia Minor, vilayet of Kastamuni, 88 m. s.w. of Amasia. In its vicinity are the ruins of a magnificent temple, supposed to be that of Jupiter which Strabo mentions (lib. xii.). A perfect ground-plan of the building still remains; the length outside is 219 ft., the breadth 140 ft., while the cella measures 87 ft. by 65. There are several other ruins which seem to identify B. K. as the ancient *Tavium.*

BOGHEAD COAL, bituminous coal of Scotland, more valuable for making gas than for fuel. Named from the chief place of deposit, Boghead, Linlithgowshire.

BOG IRON ORE, a mineral of very variable composition, but regarded as consisting essentially of peroxide of iron and water; the peroxide of iron often amounts to about 60 per cent, the water to about 20. Phosphoric acid is usually present in quantities varying from 2 to 11 per cent. Silicic acid, alumina, oxide of manganese, and other substances, which seem accidentally present, make up the rest. B. I. O. occurs chiefly in alluvial soils, in bogs, meadows, lakes, etc. It is of a brown, yellowish-brown, or blackish brown color. Some of its varieties are earthy and friable, formed of dull dusty particles; some are in masses of an earthy fracture, often vesicular; and some more compact, with conchoidal fracture. It is abundant in some of the northern and western

islands of Scotland, and in the northern countries of Europe generally; also in North America. When smelted, it yields good iron. See IRON, ORES OF. From what source the iron in B. I. O. is derived, has often been a subject of discussion; but Ehrenberg appears to have determined that it proceeds from the shields of animalcules, and he regards the mineral itself as composed of incalculable multitudes of these shields. He found in the marshes about Berlin a substance of a deep-ochre yellow passing into red, which covered the bottom of the ditches, and which, when it had become dry after the evaporation of the water, appeared exactly like oxide of iron; but which under the microscope was found to consist of slender articulated threads, formed of the partly silicious and partly ferruginous shields of *Gaillonella ferruginea*.

BOG MOSS. See SPHAGNUM.

BOG'NOR BEDS. See LONDON CLAY.

BOGODOUKHOV', or BOHODUKHOV', a fortified t. of Russia, in the government of Kharkov, 29 m. n.w. of the city of that name. It is situated on the Merle—the chief industry of its population, which amounts to about 10,000, consisting in leather-dressing and boot-making. B. has also a considerable trade in cattle and hides.

BOGOMI'LI, a religious sect which came into notice in the 12th c., whose chief seat was in Thrace. They resembled the Paulicians and Kathari. Their name, which is derived from the Bulgarian *Bog*, "Lord," and *milui*, "have mercy," refers to the frequency of their prayers. The basis of their creed was as follows: Out of the eternal divine essence or being sprang two principles—Satanael and Logos; the former, at first good, afterwards rebelled, and created in opposition to the original spiritual universe a world of matter and human beings. These human beings, however, received from the Supreme Father a life-spirit; but this was kept in slavery by Satanael until the Logos or Christ came down from heaven, and assuming a phantom body, broke the power of the evil spirit, who was henceforth called only Satan. The B., like all similar sects, practiced a severe asceticism, despised images, and rejected the sacraments. Instead of baptism, they placed their hands, and an apocryphal gospel of St. John, on the head of the neophyte, singing at the same time the Lord's Prayer, which they repeated seven times during the day, and five times during the night. They accepted the whole of the New Testament, but of the Old Testament only the Psalms and Prophets, which they interpreted allegorically. In 1118, that vehement hater of heretics, Alexius Comnenus, burned their leader Basilius. Persecution, however, did not put an end to the B., and at the time of the Mohammedan conquest of Bosnia (16th c.), we find that the greatest number of the renegade Christians who embraced the religon of the conquerors belonged to this sect. There are some B. even at the present day.

BO'GOS, negroes living in the highlands n. of Abyssinia, believed to number about 10,000, and speaking the Belen and Tigre tongues. They profess Christianity, but have little knowledge of it, and are tributary to Abyssinia. Their country is rich in fine timber, fruits, and wild animals.

BOGOTA', more fully **SANTA FÉ DE BOGOTA'**, in South America, the federal capital of the United States of Colombia, formerly New Granada. It is situated within the limits of Cundinamarca, in lat. 4° 6′ n., and long. 78° 30′ w., on a table-land, which, at an elevation of 8694 ft. above the sea, separates the basin of the Magdalena from that of the Orinoco. Independently of its political importance, B. occupies a commanding position in relation to commerce. It lies on the most convenient route between Quito and the Caribbean sea; while, by navigable affluents of the Orinoco and the Magdalena, distant respectively 37 and 55 m., it enjoys a twofold access to tide-water. Its immediate vicinity, too, is favorable to the growth of a great city and the maintenance of a large population. The table-land measures about 60 m. from n. to s., and about 30 from e. to w., being bounded on all sides by mountains which, though lofty enough to give shelter, are yet below the line of perpetual snow. This extensive plain—a temperate zone on the verge of the equator with a singularly genial and salubrious climate—is exceedingly fertile, yielding abundant crops of wheat and barley, as also generally of the leguminous plants cultivated in Europe; while, favored as it is with two rainy seasons in a year, it is as rich in pasture as in grain, affording ample sustenance to numerous flocks of sheep and herds of cattle. B. was founded in 1538, consisting then of 13 houses in honor of the 12 apostles. In 1800, it contained 21,464 inhabitants; and in 1821, 30,000; and now it is stated at 50,000. Prospectively, also, the surrounding mountains promise, one day, to give to industry many valuable minerals, such as iron, coal, and salt. The last two, in fact, have already been obtained to some extent. Mines of emeralds, gold, silver, and copper are also said to exist within the same district. B. is regularly and handsomely built. It has four public squares and five elegant bridges over two small rivulets—the San Francisco and the San Augustin. Like every place in Spanish America, it teems with churches and convents—two of the latter overhanging the city on twin hill-tops at a height of 2500 ft. above the general level. B. likewise possesses, in addition to official buildings, a mint, a theater, a university, and spacious barracks. A short way from the city, the rivulets above mentioned join a stream of the same name as the town itself.—The river Bogota, otherwise called the Funcha, is in itself an object of physical interest. It is the single outlet of the waters of the table-land,

which, both from geological features and from aboriginal traditions, appears to have once been a land-locked basin, somewhat like the still loftier and larger plateau of Titicaca. Be this as it may, the river B. has found, if it has not forced, a passage for itself towards the Magdalena. At the cataract of Tequendama the waters plunge over a precipice 900 ft. high; and the clouds of spray clothe the adjacent grounds in the most luxuriant vegetation. About the center of this cataract, known as the fall of Tequendama, stands the natural bridge of Iconouzo, formed as if by the fortuitous jamming of rocks from the opposite sides of the cleft. Between the crest and the foot of this fearful torrent, there exists a difference of climate, which is obviously disproportioned to the mere difference of elevation; and the excess may perhaps be ascribed, in conjunction with the ceaseless moisture, to the wall-like precipice behind, which, besides intercepting the winds, increases by reflection the heat of the sun.

BOGOUSLAV, or BOGUSLAW, a t. of Russia, in the government of Kiew, about 70 m. s.s.e. of the city of that name. It is situated on the Rossa, and has a pop. of 6000, chiefly Jews.

BOG SPAV'IN. This singular name has been applied to a lesion of the hock-joint of the horse, consisting in distension of the capsule inclosing the joint. It usually arises suddenly from a sprain in action. It most commonly affects young horses with defective hocks, and is associated with other indications of weakness of the injured joint.

Symptoms.—As the immediate result of a violent sprain, the hock becomes swollen, hot, and tender, and there is considerable lameness. The acute symptoms subside readily, but a circumscribed swelling remains towards the front, inner, and lower part of the joint. The swelling is soft, partly disappears on pressure, if the joint is moved; but on the horse standing firmly on its limbs, the projection is distinctly visible. At every recurring strain, lameness supervenes, but commonly passes off within a short time. If the B. S. has accidentally occurred in a young horse with good hocks, it may never be attended with inconvenience, and the acute symptoms mentioned do not relapse.

Treatment.—The treatment of B. S. consists in the application of stimulating embrocations, or mild blisters, in the early stage, in severe cases, the golden ointment of iodine is the best application; but we can only obtain a reduction in the inflammatory symptoms, and disappearance of the lameness. The capsular ligament which is injured is never again completely restored, and the horse is more or less blemished for life. See SPAVIN.

BOG-TROTTER, an appellation sometimes contemptuously given to the lower class of the Irish peasantry, has its origin in the ability acquired by many of them of traversing the extensive bogs of their native country, passing from tussock to tussock, where a stranger would find no secure footing, and in the frequent use which they have made of this ability to escape from soldiers, officers of police, or other pursuers.

BOGUE, Rev. DAVID, the founder of the London missionary society, was a native of Berwickshire, being b. at Hallydown, Feb., 1750. After studying at the Edinburgh university, and obtaining his license as a preacher in connection with the church of Scotland, he, in 1771, went to London, where he was for some time engaged in tuition. He afterwards accepted the charge of an independent church at Gosport, where he established a seminary for the education of students who purposed to become Independent ministers, an institution which had a great influence on the connection, as well when it had this object in view as afterwards, when it became a school for the training of missionaries. B. now conceived the idea of a grand missionary scheme, which was ultimately realized in the London missionary society. He also took an active part in the establishment of the British and foreign Bible society and the religious tract society. From this time until his death, which took place in Oct., 1825, he devoted himself zealously to the cause of missions. On his death, an extraordinary meeting of the London missionary society was convened, and resolutions passed expressive of its sense of bereavement, and of the benefits which the deceased had conferred on the society. B. was the author of *An Essay on the Divine Authority of the New Testament*, which has had a circulation only second to that of Bunyan's *Pilgrim's Progress*, having been translated into French, Italian, German, and Spanish; also *Discourses on the Millenium;* and in connection with Dr. James Bennet, a *History of Dissenters*, from the revolution of 1688 to 1808.

BOGUS, bad, or counterfeit; colloquially applied to coin, notes, and even persons, to indicate spuriousness or fraud. It is said to be a partial pronunciation of the name of one Bonghese, a counterfeiter and rogue in general, who some years ago victimized the people of the western states.

BOHADDIN, or BOHA-EDDYN (ABUL-MOHASSEN YUSUF-IBN-SHEDAD), 1145–1235; an Arabian writer and statesman, eminent in the study of the Koran, as well as in jurisprudence. By a work on the *Laws and Discipline of Sacred War*, he gained the favor of the famous Saladin, and was attached to the sultan thereafter, serving in several embassies, and as judge of the army, and judge of Jerusalem; under Saladin's successor he was cadi of Aleppo, where he founded a college. B. continued his intellectual labors to the age of 90 His most important work was a *Life of Saladin*, highly eulogistic, but very instructive.

BOHE'MIA (Ger. *Bö'hmen*), formerly one of the kingdoms of Europe, now forming a part of the Austro-Hungarian monarchy, is situated in lat. 48° 33′ to 51° 3′ n., and long. 12° to 16° 46′ east. It is bounded n. by Saxony and Prussian Silesia, e. by Prussia and Moravia, s. by Lower Austria, and w. by Bavaria. It has an area of 19,822 sq.m; pop. '69, 5,140,544; '75, 5,361,506. It is divided into thirteen circles—viz., Prague, Leitmeritz, Jung-Bunzlau, Jičin, Königgrätz, Chrudim, Caslau, Tabor, Budweis, Pisek, Pilsen, Eger, and Saaz. It contains nearly 400 cities; 250 market-towns; and 650,000 dwelling-houses. B. is surrounded on all sides by lofty mountain ranges, the principal of which are the Riesengebirge (part of the Sudetic chain) on the n.e., dividing B. from Prussia and Silesia, and attaining, in the peak of the Schneekoppe, a height of 5275 ft.; on the n.w., the Erzgebirge, with a height, in some places, of more than 4000 ft.; on the s.w., the Böhmerwald, reaching in its highest point an elevation of 4613 feet. Offsets from these traverse the interior of the country, which has an undulating surface, sloping generally to the center. B. has several fine valleys, the chief of which are those of the Moldau and the Elbe. The country belongs to the upper basin of the Elbe, which rises in the Riesengebirge range; and it is well watered by the affluents of that river, the principal of which are the Moldau—which has its source in the Böhmerwald, and which is navigable from Budweis to Melnik, where it joins the Elbe, a distance of 148 m.—the Eger, Iser, Aupa, Metau, Biela, and Erlitz. B. has no lakes of any considerable size.

The climate of B. is cold in the mountainous regions, the higher peaks being covered with snow during a great portion of the year, but mild in the valleys, and, on the whole, healthful.

The mineral wealth of B. is varied and extensive, consisting of silver, tin, copper, lead, iron, cobalt, alum, sulphur, graphite, calamine, cinnabar, porcelain clay, with several precious and ornamented stones, such as Bohemian garnet (*pyrope*), rubies, sapphires, etc. Of coal, B. produces more than all the rest of the Austrian empire together. It also yields a large supply of asphaltum. Mineral springs are abundant, and those of Carlsbad, Marienbad, Eger-Franzensbad, Teplitz, Elisenbad, etc., are celebrated places of resort.

The soil of B. is generally fertile. More than one half of the area consists of arable land; nearly one eighth is laid out in meadows and gardens; pastures form about a twelfth; vineyards, a very small portion; and forests cover nearly a third. The wheat raised in B. is about a seventh of the produce of the whole Austrian empire. The rye, barley, and oats are, the first a fourth, and the latter two a sixth of all the produce of these kinds of grain. This indicates an agricultural importance to the country, in relation to the Austro-Hungarian empire, not to be easily estimated. Flax and hops are important products in a manufacturing point of view; the yearly crop of flax amounts to 200,000 cwts. Bohemian hops are famous, and 50,000 cwts. are on an average produced yearly. A great variety of fruit is cultivated and exported in large quantities. The culture of the vine is confined to the vicinity of Prague and the lower part of the Elbe.

Various kinds of game are found, and the breed of pheasants is celebrated. Horned cattle, sheep, goats, and swine are reared extensively in some districts; and in the s., geese form an important item in the resources of the country.

In manufactures, B. holds a very high place among continental countries. It is the chief center of dyeing and calico-printing. The linen manufacture, which is more extensive than that of all the other Austrian provinces together, consists of damask, cambric, lawn, and other fine varieties, in addition to the ordinary qualities of cloth. Of the 403,000 spindles employed in flax-spinning in the empire, Bohemia reckons 260,400. The chief seat of the woolen manufacture is Reichenberg and its neighborhood. Another important branch of industry is the paper-manufacture, of which B. possesses more than the half. The glass-works of B. are celebrated, and very numerous and extensive, affording employment to thousands. Beet-root sugar is manufactured extensively, and there are hundreds of breweries and brandy distilleries throughout the country, but they are mostly on a small scale. The manufacture of iron is considerable. The position of B. secures it a large transit trade. Steam-packets ply on the Elbe and Moldau; the horse-railway which, till 1869, connected these rivers at Budweis and Linz, was the oldest on the continent. B. has good roads, and there is an excellent system of railways centering in the capital, Prague.

Population, Religion, and Education.—The Czechs, a Slavonic race, form the bulk of the people. They number 2,930,300, and dwell chiefly in the center and e. of the country. The German population, amounting to 1,835,830, reside mainly on the outskirts, especially in the n.e. The few remaining are Jews. The vast majority of the population (4,599,400) belong to the Roman Catholic church, but other religions are tolerated; the number of Protestants only amounts to 166,000, and the number of Jews is 99,700. The Roman Catholics are under the supervision of the archbishop of Prague, and the three bishops of Leitmeritz, Königgrätz, and Budweis. The monasteries and convents number between 120 and 130. Education is much more widely diffused than in any of the other provinces of Austria. The educational establishments include the university of Prague, 20 gymnasia, and 30 other higher schools; besides 4,550 public schools. B. sends 54—about a fourth of the 203—mem-

bers to the lower house of the Austrian reichsrath, or parliament of the western part of the empire.

History.—The *Boii* (q.v.), from whom B. derives its name, settled in the country in the 2d c. B.C., but were expelled by the Marcomanni about the beginning of the Christian era. The victors themselves soon gave place to others, and as early as the 5th c. A.D., we find B. peopled by the Czechs, a Slavic race. In the latter part of the 9th c., Swatopluk, the king of Moravia, subjugated Bohemia and introduced Christianity. After his death, the dukes of Prague, who in 1061 had the title of king conferred on them, by the emperor Henry IV., ruled the country as a state in the German empire until 1306, when the last of the dynasty was assassinated.

From 1310 to 1437, B. was ruled by kings of the house of Luxemburg. In the time of Wenzel IV. (Wenceslas), a reformation of religion took place under John Huss (q.v.) and Jerome of Prague (q.v.). After the death of Wenzel IV., the imprudent measures adopted by the emperor Sigismund excited in B. a war of sixteen years' duration, which ended in making B. an elective kingdom. In 1458, the shrewd and able Protestant noble, George von Podiebrad, ascended the throne. His successor, Ladislaus (1471–1516), was elected (1490) to the throne of Hungary, and removed the royal residence to Ofen, where also his son and successor, Lewis (1516–26), resided. After his death in battle against the Turks at Mohacz (1526), B. and Hungary passed into the hands of Ferdinand I. of Austria, who had married Lewis's sister. From that time, the history of B. merges in the history of Austria (q.v.).

Bohemian Literature.—The Czechs of B. possess a literature older than that of any other people of the Slavonic stem. Its origin may be dated with certainty as early as the 10th century. Of the oldest period—or before the time of John Huss the reformer—21 poetical and more than 50 prose works are extant. Among the former, the remains of a collection of ballads, etc., made in the 13th c., are remarkable for their poetical merit. John Huss in B., like Luther in Germany, began a new era in literature (1409–1526); but the impulse of his example was far more important than his own writings. The literary remains of the Hussite sects in the 15th c.—dogmatic, polemic, and ascetic works—are still numerous in the old libraries and archives of B., though very many of them perished in the flames the Jesuits kindled during the thirty years' war. Even so late as 1750, the Jesuit, Antony Konias, boasted that he had burned 60,000 Bohemian books. Of historical works of this period, some remains have been edited by Palacky in his *Scriptores Rerum Bohemicarum*, 1829.

The period 1526–1620 is regarded by the Bohemians as their golden age of literature. In this time, especially under Rudolf II. (1576–1611), the arts and sciences were generally cultivated. Prague had two universities and sixteen schools, and the Bohemian language had reached its highest point of cultivation. It cannot, however, be said that the literary works of this period display any great originality of genius. Among the most noticeable is a Bohemian translation of the Bible, which was finished in 15 years by 8 scholars, assembled by John of Zerotin at his castle of Kralic, in Moravia, and was published 1579–93. It is a model of pure and elegant Bohemian.

In Dec., 1774, an imperial decree was issued, ordaining that the German language should be employed by all teachers, lecturers, etc., in the upper schools. This harsh measure excited considerable opposition; and several writers came forward to vindicate the claims of the persecuted dialect, and to develop its powers; but their efforts were attended with little success.

A new and better era began in 1818, with the discovery of valuable remains of old literature, and the publication of edicts favorable to the use of the Bohemian language in schools. Since that time, the progress of the language, as a vehicle of literature and science, has been rapid, and a love of the old dialect has been extended through all classes of society. In Bohemian poetry and belles-lettres, the names of Czelakowsky, Kollar, Holly, Langer, and Schneider, are distinguished. Among scientific writers, mention may be made of Jungmann, Schafarik, Wenzel Hanka, and Presl. In history and archæology, the names of Palacky, Tomek, Schafarik, and Wocel are worthy of notice. Papers entirely political and of mixed politics and literature circulate more largely in B. than in any other part of the empire. In 1875, 108 papers were published in Bohemian, 11 daily. Since 1831, a committee for the cultivation of Bohemian literature has been in existence. Several important works, among them Schafarik's *Slavonic Antiquities*, and Jungmann's *Large Lexicon*, and his *Literary History*, have been published by aid of the committee.

The *Bohemian language* is one of the best dialects of the west-Slavonic; it is spoken not only in B., but also in Moravia, and among the Slowaks in Hungary. Among its sister-dialects, it is distinguished by copiousness of root-words, great flexibility in combinations, precision, and accurate grammatical structure; but like all the Slavonic and most modern dialects, it has no specific form for the passive voice of the verb. The orthography introduced by John Huss in the 15th c. is precise and consistent with itself. Every letter of the Roman alphabet has its one distinct sound. Bohemian prosody is distinguished from that of most European languages by the use of quantity instead of accent, so that it can copy faithfully all the ancient Greek and Roman meters. No other modern language can translate the ancient classics so readily and yet so completely and forcibly, as the Bohemian. Its grammatical forms are complicated and difficult.

BOHE'MIAN BRETH'REN is the name of a religious society which was first instituted in Prague about the middle of the 15th century. It was originally composed of remnants of the Hussites. Dissatisfied with the conduct of the Calixtines (q.v.), they betook themselves, in 1453, to th eborders of Silesia and Moravia, where they settled. Here they dwelt in separate communities, and were distinguished by the name of Brothers of the Rule of Christ. Their adversaries often confounded them with the Waldenses and Picards, while on account of their being compelled during persecution to hide in caves and solitary places, they were also called cave-dwellers (*grubenheimer*). In spite of oppression, such was the constancy of their faith and purity of their morals, that they became profoundly respected, and their numbers greatly increased. The chief peculiarity of their creed was the denial of the ordinary Catholic doctrine of transubstantiation; but, in truth, they rejected tradition generally, and professed to found their tenets only on the Bible. Their ecclesiastical constitution and church discipline—of which the Lutheran reformers spoke highly—was a close imitation of that of the primitive Christian communities. They even went the length of practically denying anything to be secular; and, under the impression that religion should consciously penetrate and characterize the entire life of men, they extended ecclesiastical authority over the very details of domestic life. Their chief functionaries were bishops, seniors and conseniors, presbyters or preachers, ædiles, and acolytes. Their first bishop was consecrated by a Waldensian bishop; though they never united themselves with the Bohemian Waldenses. It was against their principles to engage in war; and having, on several occasions, refused to take up arms, they were at last deprived of their religious privileges. The result was, that, in 1548, about a thousand of the brethren removed to Poland and Prussia. The contract which these exiles entered into with the Polish reformers at Sandomir, 14th April, 1570, and, still more, the religious peace concluded by the Polish states in 1572, secured their toleration; but subsequently, in consequence of the persecutions of king Sigismund III., they united themselves more closely to the Protestants, though even at the present day they retain something of their old ecclesiastical constitution. The brethren who remained in Bohemia and Moravia obtained a little freedom under the emperor Maximilian II., and had their chief seat at Fulnek, in Moravia. In the 17th c., a number removed into Hungary, but during the reign of Maria Theresa were coerced into Catholicism. The thirty years' war, so disastrous to the Bohemian Protestants, entirely broke up the societies of the B. B.; but afterwards they united again, though in secrecy. Their exodus about 1722 occasioned the formation, in Lusatia, of the *United Brethren*, or Herrnhuters. See MORAVIANS.

BOHEMIAN FOREST, or BÖHMERWALD, the mountainous boundary between Bohemia and Bavaria, separating the basins of the Elbe and the Danube; extending 130 m. from s.e. to n.w.; the highest summits 4848 and 4743 ft above tide. Most of the range is covered with dense forests. A railway crosses it through the valley of the Cham.

BOHEMIAN LANGUAGE and LITERATURE have been subjected to literary culture from about the 9th century. The language is the harshest and strongest of the many dialects of the Slavonic family. It abounds in consonants so mixed that to English eyes the words appear unpronounceable. The Bohemians call themselves Czechs (*Cechi*, pronounced tchek-hi), and claim to be the original of their family of peoples. Christianity was introduced near the close of the 9th c., and a few fragments of pre-Christian literature were found in 1817 preserved in a manuscript in a church steeple. The first literary productions of consequence, however, were due to the early German Christians, and were written in Latin. It was not until the beginning of the 14th c., under Charles IV. of Germany, that the native language obtained imperial favor. Dalimil wrote his *Rhyming Chronicle of Bohemia* about 1314, and translations were made from the Latin and other languages into the Bohemian tongue. Sir John Mandeville's travels was one of the books earliest translated, and a complete version of his adventures was made about the end of the century. Among those who should be mentioned as original writers are Thomas Stitny the domestic moralist, Duba the jurist, and Flaska the didactic poet. The next generation witnessed the attempts at both religious and linguistic reform that came to an end in the burning of John Huss and the persecution that followed. The Bohemian language was, indeed, brought into general use, and served the disputants on both sides; but little was assigned to its keeping except the ephemeral productions of political and ecclesiastical strife. A large collection of these works, saved from destruction by the invading Swedes, is still preserved in the library of Stockholm. Of more permanent interest is Paul Zidek's *History of the World*, the travels of Leo of Rosmital through various parts of Europe; those of Kobatnik in Egypt and Asia Minor, and of John of Lobkowitz in Palestine. In the 16th c. there was a remarkable development of prose in various departments of literature. Weleslawin, Paprocky, and Hayek of Liboczun wrote popular histories; Wratislas of Mitrovic, and Prefat of Wilkanowa gave accounts of their travels; and Nicolas Konec, Dobrensky, and Lomnicky produced didactic works. A long period of literary decadence followed the battle of White Mountain (1620); the best blood of the nation went into exile, and such Bohemian literature as came forth appeared in foreign countries. In 1774 a severe blow was struck at the native language by Maria Theresa's decree which enforced the use of German in the higher and middle schools of the country. But the defense of the native tongue was

taken up by count Kinsky, Hauka of Haukenstein, the historian Pelzel, and the Jesuit Balbin. Other scholars espoused the cause, and a chair of the Bohemian language was founded at Prague, and in 1818 a Bohemian museum was established in connection with a society that devoted itself to the study of national antiquities, which society published a journal. Puchmayer, 1795–1820, gave an impulse to national poetry, and was succeeded by Langer, Rokowocel, Schneider, Czelakowsky, H. Kollar, and many other writers. In science Presl, Sadek, Amerling, Smetana, Petcina, Sloboda, and Opiz have attained distinction. The names of writers in politics, theology, and philosophy are too numerous to mention.

BOHEMOND I., eldest son of the Norman conqueror of Apulia and Calabria, Robert Guiscard, was born about 1056, and during his youth distinguished himself in his father's war against the Byzantine emperor, Alexis Comnenus (1081–1085). After his father's death, he was excluded from the throne of Apulia by his brother Roger, and only gained the principality of Tarentum after a long contest. He joined the crusade of 1092 with a large army—most of which he had won over from his brother's service—and took a prominent part at the fight of Dorylæum, in Cilicia, in 1096, and at the capture of Antioch, 1098. While the other crusaders advanced to storm Jerusalem, B., remained in Antioch, where he established himself as prince. Being soon after besieged, the Christians, reduced to extremities, came out, and gave the sultan battle, and entirely routed his forces, B. greatly distinguishing himself in the fight. He was afterwards made prisoner by a Turkish emir, and remained two years in captivity. Tancred, meanwhile, looked after his interests in Antioch. B. returned to Europe to collect troops, and after defeating Alexis in several engagements, was acknowledged by that emperor as prince of Antioch. He died in Apulia, 1111.—His son B. II., a minor at the death of his father, assumed the government of Antioch (after Tancred had been regent for some years) in 1126, and was killed in battle, 1130.—B. III., grandson of the former, was allowed to retain sovereignty only by the clemency of Saladin, and died 1201.—B. IV. (1233–51) and B. V. (died 1275) were insignificant princes; and with B. VI. the Christian dynasty in Syria was brought to a close.

BOHLEN, PETER VON, 1796–1840; a German oriental scholar, mainly self-educated; professor of oriental languages in the universities of Halle, Bonn, and Konigsberg. His works, except an autobiography, are mostly on the languages of the East.

BÖHLER, PETER, 1712–75; a German theologian and Moravian bishop, who came to America in 1738, and founded the village of Nazareth, in Pennsylvania.

BÖHM, THEOBALD, a Bavarian flute-player, b. 1802; the inventor of the flute bearing his name, which has superseded the old kinds. He had some reputation as a composer.

BÖHME, or **BÖHM**, JAKOB, a German theosophist and mystic, was born of poor parents at Altseidenberg, near Görlitz, in Upper Lusatia, 1575, and spent his boyhood in tending cattle. He received no instruction till he was ten years of age; but even then, the contemplation of earth and sky had so excited his naturally pious imagination, that he conceived himself inspired. He learned the trade of a shoemaker, but continued to devote much of his time to meditation on divine things. About 1612 was published his first book, called *Aurora, or the Morning Redness.* It contains revelations and meditations upon God, man, and nature; betokens a remarkable knowledge of Scripture, especially of the apocalyptical books; as also a familiarity with the writings of the mystico-philosophic alchemists. It was condemned by the ecclesiastical authorities of Görlitz; but the persecutions to which its author was subjected, had not the effect of convincing him of his errors. B.'s fundamental speculation is, that the forthcoming of the creation out of the divine unity—which is itself distinguishable into a trinity—can be contemplated by mystic illumination, and expressed in words. The object of his mystic contemplation, accordingly, is twofold; first, God himself apart from creation, or, to use some of B.'s own synonyms, the groundless, the eternal one, the silent nothing, the *temperamentum;* and, secondly, the forthcoming of the creature out of God. This forthcoming of the creation, which is also an in-going of the silent nothing, is, according to B., the principle of negation, and he calls it "contrariety." "All things," he says, "consist in yes and no. The yes is pure power and life, the truth of God, or God himself. The no is the reply to the yes, or to the truth, and is indispensable to the revelation of the truth. So, then, the silent nothing becomes something by entering into duality;" and so on into what most minds will think utter unintelligibility. Numerous attacks from theologians disturbed B.'s last years, but he bore them all with great meekness. They were probably occasioned by a tract on repentance which his friends had printed without his knowledge; and so great was the interest excited, that he was induced by the solicitations of certain courtiers and of his friends, to visit Dresden for the purpose of having his doctrines investigated. The court applauded and protected him. On returning to Görlitz he took ill, and died 27th Nov., 1624. The first collection of his writings was published by Betke (Amsterdam, 1675); the most complete in 1730, at the same place; and the latest (1831–46) by Schiebler, at Leipsic. Next to Germany, Holland and England are the countries in which B.'s works have been received with most favor. In England, where B. was generally called Behmen, a translation in 2 vols.

quarto was published in 1764. Sir Isaac Newton studied him; William Law, of Oxford, might be called a disciple; in 1697, Jane Lead, a fanatical disciple of B., founded a sect called the Philadelphists, for the exposition of his writings; and John Pordage, a physician, is also famed among his English interpreters. Abraham von Frankenberg, who died in 1652, published the earliest biography of Böhme. In modern times, and in connection with speculative philosophy in Germany, his views, which had come to be regarded as empty mysticism, have acquired fresh interest and importance. This arises from the kindred character of his fundamental principle with the spirit pervading the systems of Spinoza, Schelling, and Hegel. The intellectual contemplation of the absolute, out of which the contradictions in the world of phenomena proceed, and into which they return, is common to these systems and to B.; Hegel, indeed, expressly represents B.'s negativity, the active principle of development, as an obscure foreshadowing of his own intuitions, and on that account places him at the head of modern philosophy. The terminology of his philosophy, as will be seen from what we have quoted, is utterly fantastic; but his imagination often conceives splendid ideas, which are more profoundly appreciated in the 19th than they were in the 17th century. See Hamberger's (1844), Fechner's (1857), Peip's (1860), and Harless's (1870) works on B. and his philosophy.

BOHN, Henry G., a well-known author, translator, and publisher, of German parentage, was born in London, Jan. 4, 1796. It is impossible to estimate too highly the services he has rendered to the community by republishing, at a cheap rate, a vast number of the most valuable works in literature, science, philosophy, theology, etc. Such collections as the Standard library (130 vols.), the Scientific library, Library of French Memoirs, the Illustrated library, the Classical library (consisting of translations into English of the Greek and Latin authors), the Antiquarian library, the Ecclesiastical library, etc., contain the intellectual wealth both of the ancients and moderns. Mr. B. has also obtained distinction as the editor of the *Bibliotheca Parriana*, of Lowndes's *Bibliographer's Manual*, etc., and as translator of Schiller, Goethe, and Humboldt. He has compiled a *Polyglot of Foreign Proverbs*, an *Illustrated Handbook of Geography*, and a *Handbook of Pottery and Porcelain*.

BOHOL', or Bool, one of the Philippine islands, discovered by Magellan in 1521: in 9° 54′ n., and 124° 21′ e.; 46 by 32 m.; produces rice, cotton, cocoa-nuts, cocoa-nut oil, cattle, and coarse silk. There is some gold in the rivers.

BOHTLINGK, Otto, b. St. Petersburg, 1815; a member of the academy of science and councilor of state; well versed in Sanskrit, Yakut, and oriental tongues. His main work is a comprehensive Sanskrit-German dictionary in 7 vols., in which he had the assistance of prof. Rudolf Roth, of Tübingen.

BOHUN UPAS. See Upas, *ante*.

BOIARDO, Matteo Maria, Count of Scandiano, one of the most celebrated Italian poets, was b. at Scandiano in 1430 or 1434. After completing his studies at the university of Ferrara, he was introduced at the court of duke Borso d'Este, by whose successor, Ercole I., he was promoted to several honorable offices. In 1478, he was made governor of Reggio; in 1481, governor of Modena; and six years later, he again became governor of Reggio, where he died in 1494. His chief work is the romantic chivalrous poem, *Orlando Innamorato*, which he left unfinished in three books. Former writers had described Orlando only as a cold, pure, champion of Christendom; but B. introduced the element of love, to give an additional charm to romantic adventure. The method in which he does this not only proves him to have possessed a truly creative faculty, but also brings his conception nearer to the reality of history. B. furnished to all his poetical successors, even to Ariosto himself, the personages who figure in their adaptations of the old romance. His work was printed sixteen times before 1545, and was translated into French as early as the 16th century. As it was written in the dialect of the court of Ferrara, it failed to give satisfaction to the Florentines. Accordingly, after several attempts had been made to purify its diction, Lodovico Domenichi (died 1564) produced a *Riformazione* of the poem, 1545, without making any important change in the substance. Berni, in his *Rifacimento*, proceeded further, and gave to the whole poem a tone of burlesque; but his version enjoyed such popularity that it took the place of the original, which was almost entirely forgotten, until it was republished with introduction and critical observations by Panizzi (9 vols. Lond. 1830), and afterwards by Wagner in his *Parnasso Italiano Continuato* (Leip. 1833). The other works of B. include *Sonetti e Canzoni* (Reggio, 1499); *Il Timone*, a five-act drama (1600); *Cinque Capitoli in Terza Rima* (1523); and *L'Asino d'Oro*, a version of the *Golden Ass* of Appuleius (1523); besides a translation of Herodotus (1533), and of Riccobaldi's *Chronicon Romanorum Imperatorum*.

BOI'I, the name of a Celtic people who at a very remote period seem to have inhabited either the southern part of Belgium, or a portion of France in its immediate vicinity, whence they emigrated to Italy. Having crossed the Po, they established themselves in the territory of the Umbrians, lying between that river and the Apennines, and for some hundreds of years waged a fierce war with the Romans. They were defeated at the Vadimonian lake in 283 B.C.; at Telamon, in Etruria, in 225 B.C., during the great Gallic war, of which they were the original cause; rushed into rebellion on hearing of Hanni-

bal's march, joined him at the battle of the Trebia in 218 B.C., destroyed the entire army of the consul Postumius in 216 B.C., took a prominent part in the revolt of the Gauls under Hamilcar, and in the destruction of Placentia, 200 B.C.; but at length, in 191 B.C., they were completely subdued by Scipio Nasica, who, besides killing a vast number, took from them nearly one-half of their land. At a later period, they were dispossessed of the whole, and driven across the Alps. Their subsequent history and geographical position are not very clear. Those who settled s. of the Danube were, after a century, exterminated by the Dacians; those who returned to Gaul, were destroyed by Cæsar. The most important migration of the B., however, was that to the n. of the Danube, where they founded the extensive kingdom Boiohemum, which was overthrown by the Marcomanni under Marbod. But though the dynasty of the B. was thus destroyed, the kingdom retained the name Boiohemum—i.e., home of the B., whence comes the modern Böhmen, or Bohemia.

BOIL (allied to Lat. *bulla*, a bubble) is a hard painful swelling of the skin. It begins as a small hard point of a dusky red color, which is hot, painful, and throbbing. This point extends, and these symptoms increase in severity till about the sixth to the ninth day, when it ceases to enlarge, is of a conical form, with a broad firm base, and on the apex a whitish blister, which contains a little matter; this opens, and after a few days more there is discharged a core or slough of cellular tissue, and the small cavity left heals rapidly, leaving a white depressed scar.

Many kinds of boils have been described, but they may, like other diseases of an inflammatory nature, be divided into those which are *acute* and run a rapid course, as above described; and the *chronic*, which take three or four weeks to "come to a head." Boils are most common in the spring, and in young and plethoric persons, and their appearance is quite consistent with robust health. Men in training for boat-races, or others who have suddenly changed their diet and daily habits, are said to be very subject to them. There is a form of B. which generally occurs on the back of the neck, after some disorder of the stomach, in elderly people, hence it is called "Old People's Boil." In some, boils continue to succeed each other for a length of time; others are attacked during the night, after having experienced feelings of nausea and languor, by pustules, which are called night-boils (epinyctis).

The treatment of boils varies with the subject of them: in many, they are merely critical—in other words, a natural effort "to relieve some function of the body by a peculiar inflammation of the skin." The intestinal canal should be cleared out by laxative medicines, and the digestive powers improved by tonics and antacids. The skin should be kept healthy by frequent washing, while the inflamed spot should be poulticed with poppy-heads or hemlock, mixed with other materials. Wet lint is a sufficient application after the core has been thrown off. If the patient chooses to submit, however, to a momentary pain, he will, have the greatest, most permanent, and immediate relief from a cut carried quite through the boil. John Hunter, the great surgeon, got rid of habitual boils by taking repeated doses of soda in milk.

BOILDIEU, ADRIEN FRANÇOIS, an eminent French composer, was b. at Rouen in 1775. His talent for music was early developed. At the age of 18, he brought out a one-act opera in his native town, and two years afterwards he repaired to Paris, where he produced many successful compositions. When the Conservatoire de Musique was established, B. was elected a professor. In 1803, he went to Russia, where he was appointed, by the emperor Alexander, *maître de chapelle* at the imperial court. He remained in Russia eight years, during which time he produced several operas. In 1811, he returned to Paris, where he brought out *La Dame Blanche*, his most popular piece, *Jean de Paris*, *Le Petit Chaperon Rouge*, and other works. He died in Oct., 1835; and, as a tribute to his genius, the nation honored him with a public funeral. His native city claimed his heart, and to defray the pomp of its reception in the cathedral, the municipality voted 12,000 francs. The government further marked its sense of his merit by granting a pension to his son.

BOILEAU DESPREAUX, NICOLAS, an illustrious French poet, was b. near Paris, Nov. 1, 1636. After hesitating for some time in the choice of a profession, he betook himself to *belles-lettres*. In 1660, his fine powers first obtained an adequate expression in the satire, entitled *Adieux d'un Poète à la Ville de Paris*. In 1666, he published his seven *Satires*. The favorable reception which they met with, induced him to continue, until he had increased the number to twelve, of which the eighth and ninth are considered the best. In these satires, B. even ventures to castigate the *coryphæi* of the world of letters—Chapelain, Cotin, Scudery, etc. To his honor, however, it must be said that malice does not once animate his pen; he is always pleasant and gay, never cruel. His contemporaries are his laughing-stocks, not his victims. Between the years 1669 and 1696 appeared his *Twelve Epistles*. They indicate a riper genius than the *Satires*. The versification has more ease and grace; the style, a quicker movement and a firmer consistency; the thoughts are more vigorous, and more strictly concatenated; everywhere there is greater truth, color, and energy. The one addressed to Racine, who, along with B., filled the office of royal historiographer, is reckoned among his finest. In 1674, B. published *L'Art Poétique*, accompanied by a translation from the Greek of *Longinus on the Sublime*, and the greater part of *Lutrin*. These are by many French critics consid-

ered his *chefs-d'œuvre*. The first is indeed an exquisite performance, and has been copiously imitated in Pope's *Essay on Criticism*. It lays down rules for almost every species of poetry, in a clearer and more methodical manner than had ever been done before, while the whole poem is sprinkled with touches of delicate satire. The second, *Lutrin*, is a comic epic in six cantos, immensely admired by his countrymen. Besides these, B. wrote several minor pieces, both in prose and verse, such as—*Dialogue des Héros de Roman, Dissertation sur Joconde, L'Arrêt Burlesque*, and *Discours sur la Satire*. A large number of his letters have been collected. Among them are twenty to Racine. The letters of B. are in general extremely valuable, from the fact that they contain a large proportion of the literary history of the time. They also enable us to form a just idea of his character. He was high-minded, generous, and pure. In fact, his impulsive disposition and imprudent warmth of heart quite contradict the common notion of what a satirist is. When Corneille's pension was ordered to be stopped, after the death of Colbert, B. flew to the king, remonstrated against so "barbarous a spoliation," and threatened to resign his own if the decree were carried into effect. He courageously denounced the persecutors of the nuns of Port Royal; expressed his admiration of Arnauld, when the latter was on the point of being arrested; extricated out of pecuniary embarrassments many friends; and through sheer kindliness of heart, forced on a reconciliation with various of his literary adversaries. An admirer of Pascal, and a friend of the Jansenists, he could yet render homage to the talents of such Jesuits as Bourdaloue, Bonhours, and Rapin; but his most intimate and cherished companions were Molière, Racine, and Lafontaine. Until 1706, B. lived much in public, but after that his bodily infirmities induced him to retire to Auteuil. He died March 13, 1711. B.'s influence on French literature has been immense, and, on the whole, beneficial. Voltaire proclaimed him "the legislator of Parnassus."

BOILER (Fr. *chaudière*, Ger. *kessel*), the name given to a vessel in which steam, usually for a steam-engine, is generated. In its simplest form, it consists of a close vessel made of metal plate, having apertures for the admission of water and egress of steam, fitted with apparatus for showing the level of the water and the pressure of the steam, and in connection with a furnace, either internal or external. When water is boiled in an open pan, the temperature of the water and of the steam rising from it, remains at or very near 212° F., and the tension or pressure of the steam is no more than sufficient to make its way into the atmosphere, being exactly equal to that exerted in all directions by the atmosphere itself—namely, 14.7 lbs. per square inch. In a close vessel, on the other hand, the temperature and pressure to which we can raise the steam are only limited by the strength of the vessel or boiler against bursting.

The form of a boiler is determined by two considerations—namely, strength to withstand internal pressure, and efficiency in producing steam; and the object of the designer is to combine in one apparatus sufficient strength to work safely at the proposed pressure, with such a form and arrangement as shall abstract the maximum of heat from the gases of combustion, and at the same time be in all respects suitable to the special circumstances of the case. The globular form is that best adapted for strength, and was the earliest to be used. It presents to the fire, however, the minimum area in proportion to its contents, and therefore has a minimum efficiency. After spherical boilers, cylindrical ones came into use, at first set on end, and afterwards laid on their sides, and later on, these were furnished with internal cylindrical tubes for furnaces. Watt's "wagon boiler" (so called from its shape) was used for many years, but being quite unfit for any but the lowest pressures, it has long been discarded; and the "egg-end" boiler, or plain cylinder with hemispherical ends, also much used at one time, has now almost disappeared on account of its small evaporative efficiency. At present, it is quite common to use a working steam-pressure of 50 lbs. per square inch in ordinary factory boilers, and in some cases this is already greatly exceeded, while the tendency to use higher pressures seems to grow yearly. Under these pressures, the only forms of boiler which can be used without heavy and expensive internal stays to prevent the danger of bursting, are the globular and the cylindrical. The former shape is rejected for the reason already given, and the latter form is used almost invariably in the construction of modern boilers, as will be seen from the examples given below. The ends of the cylinders, when it is necessary to make them flat, must, of course, be strengthened by stays.

Boilers may be classified in several ways—as (1) horizontal and vertical; (2) internally and externally fired; and (3) plain, multitubular, and tubulous. Large boilers are almost invariably horizontal, but small vertical boilers are often used. They are employed in steam-cranes (q.v.) and other situations where great length would be an inconvenience, and often in traction-engines, where steep inclines have to be traversed, and where, if a locomotive boiler were used, one or the other end of its tubes might become uncovered, and so get burned. In Great Britain, when moderately good fuel is used, boilers with an internal furnace are generally preferred; but on the continent the common brown coal is much inferior to our fuel, and a correspondingly larger quantity of it must be used to generate a given volume of steam. As the size of a furnace limits the fuel which it can burn, this frequently involves having a much larger grate than could be conveniently arranged inside the boiler, and on this and other accounts boilers are, on the continent, more frequently externally fired than in this country.

Under the head of "plain" boilers come all ordinary cylindrical boilers, with or without internal furnaces, horizontal or vertical. They are the cheapest and simplest which can be made, and, if properly proportioned, possess a considerable evaporative efficiency. When it is necessary, however, to economize fuel, or space, or both, "multitubular" boilers are used. These derive their name from the fact that in them the flame and gases of combustion are made to pass through a great number of small tubes (surrounded by the water) on their way to the chimney. The steam-generating power of a boiler depends greatly on the extent of surface which it presents to the flame, and it is obvious that a great number of small tubes present a much larger surface than one large tube occupying the space of them all. Thus, with the same heating surface, a multitubular boiler will occupy much less space than a plain one, and at the same time the efficiency of its surface is found to be greater. It is, however, necessarily more expensive and more liable to get out of order. Tubulous boilers differ from multitubular boilers in not only containing tubes, but *consisting* of them, and having no large cylinders whatever. Their chief advantages are (*a*) their great strength, for it is easy to make a wrought-iron tube strong enough to withstand pressures far higher than any at present in use; and (*b*) the peculiarity, that if any accident happens, or explosion occurs, it will only be to one tube at a time, and not to an immense boiler shell (as with the common boiler), and its evil consequences will thus be greatly reduced. For this reason tubulous boilers are often called "safety" boilers. It will be readily understood that there is no distinct line of demarkation between the three classes of which we have been speaking, but that on account of the immense variety of boilers which have been designed and constructed, those of one class pass through gentle gradations into those of the next.

The commonest form of boiler for factories, etc., is that known as the *Cornish*, and shown in fig. 1. It consists simply of a cylindrical shell, *a*, *a*, inclosing a much smaller cylinder, *f*, *f*, called a *flue*. The ends of the flue are open, but the space between it and the shell, which contains the water, is of course closed up and made steam-tight. The fire-grate, *d*, is in the interior of the flue, and at the end of it is a brick bridge, *c*, made so as to cause the flame to impinge on the upper side of the flue. The boiler is set in brick-work; and the flame, passing out at the back end of the flue, is made to traverse the whole length of the boiler twice through brick flues before passing away to the chimney.

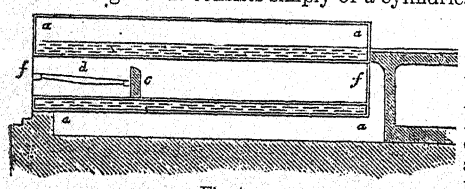


Fig. 1.

The Cornish boiler has often two internal flues or tubes, which is a much more advantageous construction than that shown in fig. 1. The *Galloway* boiler (called after its inventor) is a very excellent modification of the Cornish, which in outward appearance it exactly resembles. It has two furnaces, but these join together in one chamber just behind the bridges, and the gases are made to pass through a space considerably narrowed by side *pockets* projecting inwards in order that they may be well mixed. From this point to the back of the boiler there is just one flue, made oval in section, and crossed by a considerable number of vertical taper tubes, which form a direct communication between the water beneath and that above the flue. These tubes (called "Galloway tubes") both promote circulation and strengthen the flue. Multitubular boilers of many kinds are used, both for stationary engines and other purposes, but the largest number of those constructed are certainly for steamers, and a common type of marine boiler is shown in fig. 2. The shell, *a*, *a*, is cylindrical, and contains one or more cylindrical furnaces; *c* is the fire-grate; *d*, a brick bridge; *e*, a combustion chamber or flame-box; *f*, the tubes through which the flame passes back to the front of the boiler; and *g*, the smoke-box at the base of the funnel, *h*. The line *k*, *k*, shows the ordinary level of the water in the boiler. On board ship it is of course an object to take up as little space as possible with boiler and machinery, and at the same time to have boilers which shall use as little coal as possible, both because of the saving in cost, and because of the saving in the room taken up by coal. For all these reasons, marine boilers are invariably multitubular.

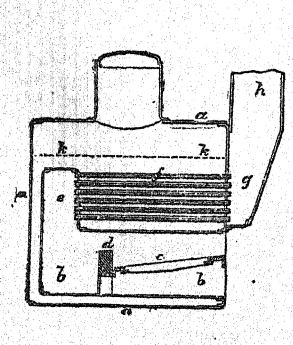


Fig. 2.

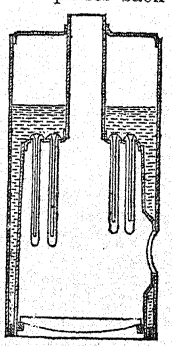


Fig. 3.

The varieties of vertical boilers are as numerous as those of horizontal. When dirty water, or water containing much insoluble sediment, has to be used (as e.g. in steam-cranes frequently), they are of the simplest construction, with nothing but an inner fire-box and an outer shell (both cylindrical), the space between them being filled with water all round and over the top of the fire-box.

If clean water can be had, however, and it is desired to be at all economical of fuel, some kind of multitubular vertical boiler must be used, and of these probably the best is that known as the *Field* boiler, and shown in fig. 3. The peculiarity of it consists in the tubes, which are closed at the bottom, and hang down from the top of the fire-box over the grate bars, and contain inner tubes of much smaller diameter. The latter are intended to aid the circulation of the water, which passes down the inner tube and up again through the annular space around it, where, being most exposed to the action of the flame, it is hottest. Of the different varieties of tubulous boilers, those manufactured by Messrs. Howard of Bedford have found most favor; but so far as can be said in the absence of any extended experience as to their working, Sinclair's patent boilers seem to be even more satisfactory. They consist of horizontal wrought-iron welded tubes placed in vertical rows, each row being connected at each end with a vertical tube, also of wrought-iron and of larger diameter. In order that the horizontal tubes may be properly fixed in the vertical ones, a hole must be provided in the side of the latter, opposite the mouth of each of the former. That these holes may be kept tight at any pressure of steam, the ingenious device is adopted of closing them with taper plugs put in *from the inside*, so that the pressure of steam keeps them shut, and the higher the pressure the less possibility of leakage there is. Locomotive boilers are always multitubular, for much the same reasons as marine boilers. The boiler of a single locomotive often contains 1500 or 1800 sq. ft. of heating surface, and occasionally as much as 2000 sq. feet.

The principal test of the efficiency of a boiler is the quantity of water (generally expressed either in pounds or gallons), which it will evaporate with the consumption of one of coal. Of course this varies very much with the quality of the fuel, but with good pit coal (not dross), a Cornish boiler should evaporate 6 to 8 lbs. of water per lb. coal, and a multitubular boiler, such as fig. 2, about 10 or 11 lb. per lb. coal. The best rate of combustion on the grate varies with the construction of the boiler, from 10 to 18 or 20 lb. per sq. ft. of grate surface per hour.

Boilers are almost invariably made of wrought-iron plates riveted together. The parts most exposed to the action of the flame are made of the best quality of iron, and the other parts of inferior qualities, according to their position in reference to the flame. Occasionally boilers are made of steel, where lightness is the chief requisite, but makers have not yet sufficient confidence in steel plates to use them very largely. Copper is often used in the fire-boxes of locomotives, but seldom in any other description of boiler. Brass boiler tubes are often seen, and on account of its better conducting qualities, brass is to be preferred to iron, but its dearness prevents its superseding iron in the great majority of cases.

Every boiler has, to render it complete and workable, a number of *fittings* or *mountings*, of which the following are the principal: A glass gauge to show the level of the water inside the boiler, and gauge-cocks for the same purpose; a gauge to show the pressure of the steam; a cock for admitting water; a cock at the bottom for emptying or "blowing off;" a valve for the discharge of the steam; one or two safety valves, weighted so that, when the pressure of steam in the boiler reaches a certain height, they open and allow the steam to rush into the air; a door by which a man can get in to clean the boiler, etc.

In order to induce a current of air through the furnace so that a proper combustion may be maintained, stationary boilers are generally provided with a chimney of considerable height, and made of brick or sheet-iron, to which the products of combustion are conducted after they have left the boiler. In locomotive boilers, and in some other cases where a sufficiently tall chimney cannot be made use of, a very powerful current is made by the ejection of the waste steam through a blast-pipe with a contracted nozzle at the base of the chimney. To prevent loss of heat by radiation, and the consequent waste of fuel, boilers should always be covered, in all parts exposed to the atmosphere, with felt or some non-conducting composition.

For further details see also BOILING, MANOMETER, SAFETY-VALVE, STEAM, STEAM-ENGINE, STEAM-CRANE.

BOILERS (*ante*). Those most distinctively American are the sectional or water-tube boilers. The Babcock and Wilcox boiler consists of a series of tubes inclined from the front to the rear, and connected at each end by a manifold chamber. The forward ends are connected to the steam-drum, which lies lengthwise of the boiler. The tubes and manifolds are in the fire chamber, and there are two sets of diaphragm plates, by which the hot gas, after rising, is deflected, first downward and then upward, being made to cross the stack of tubes three times before making its exit into the chimney. The water fills the tubes and occupies the lower part of the steam-drum. The tubes of the Root boiler are likewise inclined from front to rear; they are joined at the ends by triangular caps and crow-feet, and the joints are perfected by rubber gaskets. The joints are outside the fire chamber, and the steam-drum lies crosswise of the boiler. The water does not fill all the tube-space within the fire-box, nor enter the steam-drum; by this means dry steam is secured, while the danger of superheating is but slight, as the space not reached by the water lies in the upper and forward part of the fire-box. The Whittingham boiler has its tubes, connections, and steam-drum, all inclosed in the fire-box; the tubes are traversed by interior tubes, or flues, through which the hot gases are conveyed, and thus a large fire surface is secured. The Harrison boiler is made of cast-iron spher-

ical shells, 8 in. external diameter, and ¾ of an in. thick; they are cast in sections, 2 or 4 spheres together, are connected by curved necks of 3¼ in. diameter, and are held together by wrought-iron bolts and caps. The joints are accurately fitted, without packing.

The water surface of a boiler is that area of metal which has water within and flame or hot gases without; at this surface the steam is generated. The area which has hot gases without and steam within is superheating surface, at which the steam by the reception of heat acquires greater expansive force. The draught-area, or calorimeter, is the cross section of the area traversed by the hot gases from the fire, and may be taken at any point between the furnace and the chimney. Ordinarily, however, it is restricted to the space around the tubes in the water-tube boilers, and to the section of the flues in flue-boilers. That boiler is most efficient which shows the greatest difference between the furnace temperature and that found at the chimney, since that difference indicates the quantity of heat which has been transferred to the water in the generation of steam. If the combustion is complete, the heat of the furnace will depend on the quantity of air furnished, that is, upon the area of the calorimeter, whence it appears that the calorimeter should be large. But if this space be an unbroken volume, much of the hot gas may pass through without impinging against the boiler surface, and delivering its heat, whence it is desirable that the space should be divided thoroughly; and it is evident that a reduced calorimeter may often give better results than a larger one, not properly arranged. A designer of boilers will find important tables on this point in *Appleton's Cyclopædia of Mechanics.*

Priming is the tendency of the water in the boiler to form spray by the bursting of the steam bubbles when they come to the surface of the water, the spray going forward with the steam into the cylinder. Here it is cooled and accumulates, especially if the exhaust port is not, either by position or capacity, adequate to its discharge. Water is practically incompressible, and if a quantity of it, greater than the volume of the clearance, is found before the piston, near the end of the stroke, it lies between the piston and the cylinder head as mischievous as a mass of metal would be in the same position. Something must yield. The crank pin may be broken, or the cylinder split, or the head burst out, and all rods and gearing will be ruined. Priming is caused by want of steam room, or of area at the surface of the water in the bodies, or by the use of dirty water. The latter cause may be cured by collecting the water in tanks, and giving it time to settle. The others may be avoided by proper construction of the boiler, by checking the steam at the throttle, or by working the engine more expansively. Any sudden removal of pressure, as the opening of the safety-valve, or of the throttle in starting, tends to produce priming, because while the water had, at the instant of the opening, a capacity for steam corresponding to the higher pressure, the diminished pressure sets free a gush of steam that is entirely disproportioned to the ordinary conditions. Some authorities advise the insertion of a perforated plate through which the steam must pass on its way to the cylinder; the water beating against this plate is arrested, and the steam passes on more freely. In some locomotives the steam is taken by a longitudinal perforated pipe, which serves the purpose of the steam dome of usual designs. Boilers in which the steam does not circulate freely because of the disposition of the tubes, are liable to the annoyance of priming.

The term *horse-power,* when applied to the boiler, has a meaning scarcely more definite than when used to indicate the capacity of the engine. In either case, the horse-power realized depends as much upon the method of using the mechanism, as upon its original construction. The best authorities agree that the horse-power of the boiler should indicate the actual evaporation of water, instead of the size of the boiler or the efficiency which may be secured through the engine. The ability to evaporate a cubic foot of water per hour, making steam at 212° F., has been suggested as a suitable unit to be called a horse-power. To ascertain the evaporative power of a boiler by experiment, it is necessary to obtain the weights of fuel and water, and to know the quality of the steam produced. A trial should last 24 hours; steam may be raised, and then fire withdrawn, and the ash-pit cleared, the steam meanwhile being maintained with wood. Coal is then added, and as soon as it is fired, the test begins. Note is taken of the height of water in the gauge, and the water is left at the same height at the end of the test. Coal is carefully weighed in regular amounts and at regular intervals to avoid errors. At the end of the trial the fire is withdrawn, and the remaining coal weighed as soon as possible; this weight, plus that of the ashes made during the experiment, taken from the weight of the coal, gives the weight of fuel consumed. To find the quality of the steam, a tank is provided, which is traversed by a pipe leading to the boiler, the whole apparatus being so arranged as to waste as little heat as possible. The tank is filled with water, and steam is admitted through the pipe in such quantity as may be condensed by the water. We have to note the pressure of the steam, the weight and temperature of the water before steam is admitted, the weight and temperature at the close of the test, the weight and temperature of the water formed from the condensed steam, and the time. Experiment must also be made to test the loss of heat by radiation and evaporation, which is done by heating a given quantity of water to a given temperature in the same tank, and noting the loss in weight and temperature during a given time. To illustrate by an example. Suppose a test made, from which these data have been secured:

Coal used, 5980 lbs.; feed water used, 42,320 lbs.; coal withdrawn at end of test, with ashes, 1830 lbs.; hence, coal burned in the test, 5980 minus 1830=4150 lbs. The apparent evaporation per pound of coal is, 42,320÷4150=10.2 lbs., if the steam were dry. To test the quality of the steam the described apparatus has been used, and these data noted: Pressure of steam at gauge, 80 lbs.; weight of steam condensed at 95°, 204 lbs.; initial temperature of water for condensing, 60°; final temperature, 92°; head of water in tank, 27 in.; time of trial, 24 hours; and by former tests it appears that 4 cu. ft. of water, weighing 62.2 lbs. per ft., pass from the tank per hour, and that the loss of heat by evaporation and radiation is 1480 thermal units per hour. The heat given to the water by the condensing steam in one hour was 4×62.2× (95 minus 60) +1480=8708 thermal units. The steam condensed per hour was 204÷24=8.5 lbs., hence each pound of steam communicated to the water 8708÷8.5=1024.5 thermal units of heat. But this condensed steam was discharged at 95°; to bring it down to the standard of 32° there must have been a farther reduction of 95 minus 30=65 thermal units, showing that the quantity of heat above freezing standard held by a pound of steam as it issued from the boiler was 1024.5+65=1089.5 thermal units. The total heat, above freezing standard, of a pound of dry steam at 80 lbs. pressure (see Rankine, *Steam Engine*, or *Appleton's Cyc. of Mechanics*), is 1177.1; it is therefore evident that the steam used in the test contained some moisture. As the temperature of the feed-water was 60°, it had already 28 thermal units of heat per pound above water at 32°, and would require 1177.1 minus 28=1149.1 thermal units to change it to dry steam; but it required 1089.5 minus 28=1061.5 thermal units to change it to steam of the quality observed, hence the actual evaporation was 1061.5÷1149.1=0.91506 of the apparent evaporation. But the apparent evaporation was 8.5 lbs. per pound of coal, and the actual was therefore 7.778 lbs. If the feed-water were at 212°, 998.5 thermal units would be required to convert a pound of water into steam. Hence, 1061.5÷998.5=10.6= nearly the evaporation per pound from and at 212°.

BOILING (of liquids)—**BOILING-POINT.** When heat is applied to a vessel containing water, the temperature gradually rises, and vapor comes silently off the surface; but at a certain degree of heat, steam (q.v.) begins to be formed in small explosive bursts at the bottom, and rising through the liquid in considerable bubbles, throws it into commotion. If, after this, the steam is allowed freely to escape, the temperature of the water rises no higher, however great the heat of the fire. The water is then said to *boil*, and the temperature at which it remains permanent is its *boiling-point*. The boiling-point of water is ordinarily 212°; but every liquid has a point of its own. Thus, sulphuric ether boils at 96°; alcohol, at 176°; oil of turpentine, at 316°; sulphuric acid, at 620°; and mercury, at 662°. The boiling-point of liquids is constant, under the same conditions, but is liable to be altered by various circumstances. Water with common salt in it, e.g., requires greater heat to make it boil than pure water. The nature of the vessel, too, exerts an influence; in a glass vessel, the boiling-point of water is a degree or two higher than in one of metal, owing to the greater attraction that there is between water and glass than between water and a metal. But what most affects the boiling-point is variation of pressure. It is only when the barometer stands at 30 in., showing an atmospheric pressure of 15 lbs. on the sq. in., that the boiling-point of water is 212°. When the barometer falls, or when part of the pressure is in any other way removed, it boils before coming to 212°, and when the pressure is increased, the boiling-point rises. —Thus, in elevated positions, where there is less air above the liquid to press on its surface, the boiling point is lower than at the level of the sea. An elevation of 510 ft. above the sea-level, makes a diminution of a degree; at higher levels, the difference of elevation corresponding to a degree of temperature in the boiling-point increases; but the rate of variation once ascertained, a method is thus furnished of measuring the heights of mountains. See HEIGHTS, MEASUREMENT OF. At the city of Mexico, 7000 ft. above the sea, water boils at 200°; at Quito, 9000 ft., at 194°; and on Donkia mountain, in the Himalaya, at the height of 18,000 ft., Dr. Hooker found it to boil at 180°. Boiling water is thus not always equally hot, and in elevated places, many substances cannot be cooked by boiling. Under the receiver of an air-pump, the same effect is still more strikingly seen; water may be made to boil at the temperature of summer, and ether when colder than ice. In complete vacuo, liquids, in general, boil at a temperature 140° lower than in the open air. The knowledge of this effect of diminished pressure is now largely turned to account in sugar-boiling, in distilling vegetable essences, and in other processes where the substances are apt to be injured by a high temperature. —By increasing the pressure, again, water may be heated to any degree without boiling. Papin's Digester (q.v.) is formed on this principle. Under a pressure of two atmospheres, the boiling-point rises to 234°; of four atmospheres, it is 294°; of ten atmospheres, 359°; of fifty atmospheres, 510°.

In a deep vessel, the water at the bottom has to sustain the pressure not only of the atmosphere, but also of the water above it. At a depth of 34 ft., the pressure of the water above is equal to an atmosphre, or 15 lbs. on the sq. in.; and thus, at the bottom of a vessel of that depth, the water must be heated to 234° before it is at its boiling-point. This principle has been successfully applied to explain the phenomena of the Geysers (q.v.).

If a small quantity of water be poured into a silver basin, heated above the boiling-

point, but below redness, it will begin to boil violently, or perhaps burst into steam at once. But if the basin is heated to redness, the water will gather itself into a globule, and roll about on the hot surface, without becoming heated to the boiling-point. For the explanation of this and other interesting phenomena connected with it, see SPHEROIDAL CONDITION OF LIQUIDS.

BOILING OF LIQUIDS (*ante*). As will be understood from the above, the terms liquid and boiling-point are entirely relative, depending upon external agents and upon each other. The statement that water is a liquid is only true under certain conditions. In the arctic regions it is a solid, and in a vessel heated to 212° under ordinary atmospheric pressure it is a vapor or gas. Nitrous oxide is a liquid under ordinary atmospheric pressure when reduced below 126° below zero, and the same is true of carbonic acid when reduced to 108.76°. Pressure, however, is capable of reducing both these gases to liquids, and modern experiments with various substances are now common in which carbonic acid is liquefied by pressure. Ammonia, commonly a gas, is a liquid when reduced to —28.66°. This substance is capable of being absorbed by a very small volume of water under heavy pressure, or, at least, of occupying a very small volume; for we cannot say that the gas is really absorbed; the water assists the pressure in holding the gas in a liquid form. Advantage is taken of this in the working of a certain class of ice-making machines, called ammonia machines (q.v.). Some of the machines, however, depend upon the vaporization of ammonia, anhydrous, or nearly so, for the absorption of sensible heat. The following is a table of the boiling-points of various substances:

SUBSTANCE.	B. point F.	Barom. meas.
Nitrous oxide	—126.22°	29.88
Carbonic acid	—108.76	30.21
Ammonia	—28.66	29.50
Sulphurous acid	13.10	29.29
Chloride of ethyl	51.80	29.84
Aldehyde	67.34	28.90
Sulphuric ether	93.56	29.21
Sulphide of carbon	118.22	29.76
Bromine	145.40	29.92
Alcohol	173.32	29.92
Water	212.00	29.92
Acetic acid	242.42	29.53
Sulphuric acid	646.00	29.92
Mercury	662.00	29.92

The investigations of prof. Kopp indicate certain remarkable laws connecting the boiling-points of classes of liquids with their chemical constitution. The following tables, calculated from the observations of prof. Kopp and others, show that in the group of alcohols, and the acids derived from them by oxidation—both of which differ in constitution by one molecule of CH_2—there is a difference of very nearly 34.2° F. between successive members of the series; and that, moreover, the difference in the boiling-points between the alcohols and their respectively derived acids is about 72°.

Alcohol.	Formula.	B. point. cal.
Methylic alcohol	CH_4O	138.2°
Ethylic alcohol	C_2H_6O	174.2
Tritylic aclcohol	C_3H_8O	206.6
Tetrylic alcohol	$C_4H_{10}O$	240.8
Amylic alcohol	$C_5H_{12}O$	275.0

Acid.	Formula.	B. point cal.
Formic acid	CH_2O_2	210.2
Acetic acid	$C_2H_4O_2$	244.4
Propionic acid	$C_3H_6O_2$	278.6
Butyric acid	$C_4H_8O_2$	312.8
Valeric acid	$C_5H_{10}O_2$	347.0

Other analogous correspondences in the boiling-points of liquids and their chemical constitution were observed; thus in the series of hydrocarbons, homologous with benzole, C_6H_6, a difference in the series of CH_2 was attended with a difference of boiling-point of about 43°.

The molecular constitution, or, more strictly speaking, the mutual relations between the molecules of liquids, particularly as regards water, whose affinities are so numerous, exerts a great influence not only upon the boiling-point, but upon the nature or manner of ebullition. Thus, if a clean glass flask is partially filled with ordinary, and, of course, more or less aërated spring water, and heated rapidly with a spirit-lamp, nearly all the air will be expelled first, but before all the air is thus expelled ebullition will commence, and at a point very slightly below 212°. After a little time, more of the air having disappeared, but not entirely, the boiling-point (at 30 in. mercurial pressure) will be 212°. By continuing the boiling, however, the mode of ebullition will be found to have

changed. If the flask is held quite still there will be intervals of time—although the application of heat is constant—when ebullition will cease; and during these intervals the temperature will rise. If the heat is taken away for a few moments so as to allow the water to come to a state of comparative rest, and then reapplied, the temperature may be raised to 220° before ebullition commences, when it will be decidedly explosive. If now the flask is corked tight, and a partial vacuum formed in the space occupied by vapor, boiling will go on until the water is quite cool, but the boiling will be of the explosive character observed in the later periods of application of heat, and when quite cool will be more irregular, partly in consequence of the reduction of atmospheric pressure, but more particularly, probably because of the increased cohesion between the contiguous molecules of water by reduction of heat.

BOILING, in cookery. One important preliminary rule in boiling rests on the fact explained in a preceding article, that water cannot be heated in an open vessel, or in one with the ordinary fitting lid of a cooking utensil, to a higher point than 212°. When a vessel, then, has once begun to boil, a stronger fire than is just sufficient to keep it boiling, will only evaporate, or waste, the water in steam, but will not cook the food any faster; on the contrary, the outside will be rendered so hard by the quick boiling, that the interior will not be reached by the heat.

By long soaking in cold or tepid water, fresh meat loses much of its albumen and nutritive juice. When a piece of meat is to be boiled, it is necessary, for the preservation of these juices, and its consequent tenderness and nutritious quality, that the outside should be sealed up, by immersing it in boiling water, and keeping up the temperature for a minute; this closes up the pores, and coagulates the albumen of the exterior. The boiling water should then be taken off, and as much cold put in as will reduce it to a tepid state; it should then be gradually warmed until it reaches a degree *slightly* under the boiling-point, called simmering; at this point it must be kept without suffering any interruption of the heat, till the time elapses that is allowed for cooking the food. "The cooking goes on through the agency of the natural moisture of the flesh. Converted into vapor by the heat, a kind of steaming takes place within the piece of meat; it is, when skillfully done, cooked by its own steam."

To prepare meat for B., it should be trimmed, washed, and dried before it is placed in the water. As it simmers, the water should be kept well skimmed with a skimming-spoon, as frequently as any scum is thrown up, but with due remembrance of the fact, that raising the lid of the vessel lowers the temperature of the water; and the preservation of an equal degree of heat throughout the operation is of the greatest importance.

For fresh meat, 20 minutes is the allowance for each pound. The weather must also be considered: in frosty weather, or with very thick joints, extra 20 minutes should be given. Mutton loses in boiling, in 1 lb., 3½ oz.; beef, in 1 lb., 4 oz. Meat that has been salted and dried has its outer coat already sealed up; it requires, therefore, to be thoroughly washed, soaked for two hours in cold water, dried, and put to boil in cold water, gradually brought to the boiling-point, and kept simmering for a time, proportioned to the size of the piece. Hams and tongues to be eaten cold, should be allowed to cool in the water in which they have been boiled. The following is a time-table for the cooking of these meats, reckoning from the time the water boils: A ham of 16 lbs. takes 4 hours; a tongue of 16 lbs., 2 to 4 hours; a pig's face of 16 lbs., 2 hours; a piece of bacon of 4 lbs., 2 hours.

Poultry and white meats, as veal or rabbit, should be put at once into tepid water gradually brought to the boiling-point, drawn back immediately, and simmered, carefully skimming the water as scum rises. A chicken, or small fowl, or rabbit, will take 35 minutes; a fowl, or old rabbit, an hour, or an hour and a half, according to size. Some cooks add milk to the water, but this is apt to cause the scum to stick to the meat in streaks; some also use a cloth to inclose the meat, but this frequently imparts to it a disagreeable taste. Having trimmed, washed, and dried the meat, all that is necessary to keep it white, is to use a perfectly clean utensil, to be attentive to the skimming, and careful that no soet falls from the lid into the pot when doing this. Meat should only just be covered with water; if it wastes, a cupful of water at the same temperature should be added. The liquor in which fresh meat has been boiled, is an excellent foundation for soups and gravies.

Fish should be well cleaned and scraped; liver and roe should be carefully preserved, and boiled with the fish, in a fine net: they are used to garnish the fish. The sound of cod should be carefully cleaned, and left in the fish. Fish should be placed in cold water, in which a tablespoon full of salt and one of vinegar is mixed; should be gradually brought to the boiling-point, and simmered carefully, lest the outer part should crack before the thick part is done. If on drawing up the fish-plate, a thin knife will easily divide the flesh from the bone in the thick parts, and if the eyes contract, and become like balls, the fish is sufficiently cooked. Drain by laying the plate across the kettle covered with the lid, and dish perfectly dry on the strainer, which should be covered with a napkin.

Vegetables require generally to be well washed, and placed in B. water, in which is mixed a large spoonful of salt. When they sink, they are done. Green vegetables should be well picked, soaked in salt and water, drained and boiled in plenty of water, in a vessel without a lid. Cabbage requires two waters; spinach, very little, as it is full

of moisture. Peas and beans should not soak, but be merely rinsed in a colander. Winter potatoes should soak for an hour or more; whether they should be placed in cold or B. water, depends on the sort. A piece of soda the size of a small marble assists the B. of peas and cabbage, if the water is very hard.

For B. meat, the best vessel is one made of iron, tinned inside or not, but one kept perfectly dry, and free from grease or rust. Tinned vessels are proper for B. fish and vegetables; they require to be kept very dry, the moisture entering between the metals rusts the iron, and makes holes that cannot be mended. A tinned vessel in daily use should be polished once a week with fine whiting and oil; too frequent polishing wears off the tin. The advantage of a tin over an iron utensil is, that it gains heat sooner.

BOIS D'ARC. See OSAGE ORANGE, *ante.*

BOIS BLANC, an island of the United States of America, situated in lake Huron, between Michillimackinac and Michigan. It measures 10 m. by 3, and has a light-house at its east end.

BOIS-DE-BOULOGNE. See BOULOGNE.

BOIS-LE-DUC (Dutch, *'s Hertogenbosch*, "Duke's Forrest"), the capital of the Netherlands province of n. Brabant, is situated at the junction of the Dommel and the Aa. The fortifications are greatly strengthened by the natural situation, as the surrounding country can be flooded, leaving only two roads passable. It is a clean, well-built town, about 5 m. in circumference, intersected by canals, and has a citadel called Papenbril. B. has a very fine cathedral, and academy of arts, a grammar-school, several hospitals, etc. Iron-founding, making ultramarine, book-printing, refining salt, beer-brewing, distilling spirits, manufacturing linen-thread, ribbons, cutlery, etc., are the principal industries. Pop. (Jan. 1, 1875), 24,190. B. is a place of considerable antiquity, having been founded in 1184 by Godfrey III., duke of Brabant. The surrounding forest was cut down by his son and successor Henry, who strengthened the town with walls. In the 16th c., B. separated itself from the states, and was ineffectually besieged, in 1601 and 1603, by prince Maurice of Nassau, but had to surrender to a Dutch force in 1629. In 1794, B. was taken by the French; and in 1814, retaken by the Prussians.

BOISÉ, a co. in s.w. Idaho, on Little Salmon river; about 2500 sq.m.; pop. '70, 3834—1754 Chinese. It is a mining region. Co. seat, Idaho City.

BOISÉ CITY, in Idaho, capital and chief city of the territory, on the Boisé river, 285 m. n.w. of Salt Lake City, and 520 m. n.e. of San Francisco. It has a government assay office, and a penitentiary. It is on the site of an old trading-post of the Hudson Bay company.

BOISSERÉE, SULPIZ, a celebrated archæologist, was b. at Cologne in 1783. A visit which he and his brother Melchior (born 1786), along with their friend Joh. Bapt. Bertram, paid to Paris in 1803, inspired the trio with the idea of collecting and preserving the scattered specimens of early German art. The realization of this idea became the single object of their lives. After many years of patient and unwearied research, they gathered together 200 pictures, which received the name of "the Boisserean collection." The king of Würtemberg having presented the brothers with a spacious edifice in Stuttgart, the pictures were transferred thither, and skillfully arranged, according to their age and importance. This brought to light a very important historical fact, previously unknown—viz., that in the 14th c. Germany possessed a school of art based on Byzantine traditions. Great light was also thrown upon many of the Flemish masters, and especially on the influence exerted by Jan Van Eyck. The collection was divided into three sections corresponding to three historical periods—the first comprising the works of the Cologne school in the 14th c.; the second, those of Van Eyck and his disciples in the 15th; and the third, those of the German painters at the close of the 15th and beginning of the 16th centuries. In 1827, the collection was sold to the king of Bavaria; and in 1836 was transferred to the picture-gallery (*pinakothek*) in Munich, whither the brothers followed it. Sulpiz died in 1841, and Melchior in 1851. The former has left several interesting and valuable works; such as *Monuments of Architecture on the Lower Rhine, from the 7th to the 13th c.* (Munich, 1830–33); *Concerning the Temple of the Holy Grail*, 1834; *Collection of Old Low and High German Paintings, with Notices of the Early Painters, by Sulpiz and Melchior B. and Joh. Bapt. Bertram, lithographed by J. V. Strixner* (1822–39); and a very magnificent work, entitled *Views, Plans, Sections, and Details of the Cathedral of Cologne, with Restorations after the Original Plan, accompanied by Researches on the Architecture of Ancient Cathedrals*, etc. (1823–32).

BOISSONADE, JOHN FRANCIS, a distinguished classical scholar, b. at Paris, Aug. 12, 1774, of a noble Gascon family. He was originally intended for the administrative career, but after experiencing some of its more violent vicissitudes, he renounced it for philology, in which he had always found his favorite recreation. He soon made himself known to the critical world by his acute and learned contributions to the literary journals, was appointed professor of Greek in the academy of Paris in 1809, and entered on the active duties of the chair in 1812. In 1813, he was admitted into the academy of inscriptions; and in 1828, he succeeded Gail as professor of Greek literature in the college of France. Beyond this high position he never aspired, but pursued his investigations with an energy which no mere social or public ambition could distract. His more

important works are these: *Philostrati Heroica* (Paris, 1806); *Marini Vita Procli* (Leip. 1814); *Tiberius Rhetor de Figuris* (Lond. 1815); *Sylloge Poetarum Græcorum* (Paris, 1823–26); *Babrii Fabulæ* (Paris, 1844), etc. He contributed in his earlier years numerous papers on philological subjects to Parisian, English, and German journals, and gave the cause of classical study in France a powerful and still perceptible impulse by his eloquent and attractive lectures from his chair. In spite of his many and laborious philological works, he also signalized himself as a French lexicographer and belle-lettrist, and was one of the most copious and valued contributors to the *Biographie Universelle* He died in 1859, leaving behind him a reputation for learning almost German in its profundity, and more than English in its elegance.

BOISSY D'ANGLAS, FRANÇOIS ANTOINE, Count, an eminent French statesman, was born at St. Jean Chambre, in the department of Ardèche, Dec. 8, 1756. After filling for some time the office of major-domo to the count of Provence (Louis XVIII.), he was about to devote himself to the peaceful pursuits of science, when he was elected a deputy to the states-general. While a member of the constituent national assembly, he was accused of having a design to change the French monarchy into a Protestant republic. During the reign of terror, fear of "the mountain" kept him quiet; but, yielding to the solicitations of Tallien and Barère, he joined the conspiracy against Robespierre. Two months after the execution of the tyrant, he was elected secretary of the convention; and shortly after, a member of the committee of public safety, in which capacity he displayed remarkable talent and discretion. As director of the supply of provisions for Paris, he was exposed to popular hatred and great peril during the riotous and sanguinary proceedings of the 12th Germinal and 1st Prairial in the year 3 of the republic; but firmness and presence of mind preserved him. He was afterwards president of the council of five hundred; was called into the senate by Napoleon; and made a peer by Louis XVIII. Through all the changes of the times, he maintained the principles with which he had commenced his career. He died in Paris, Oct. 20, 1826. His chief writings are *Recherches sur la Vie, les Ecrits, et les Opinions de Malesherbes*, 1819, and *Etudes Littéraires et Poétiques d'un Vieillard*, 1825; but, in addition to these, he published numerous essays, pamphlets, and letters.

BOIVIN, MARIE ANNE VICTOIRE GILLAIN, 1773–1841; educated in a nunnery; studied anatomy and midwifery; married and was soon left a widow, when she took the place of midwife in the maternité hospital, and in 1801 became superintendent. She caused the establishment by Chaptal of a special school of accouchement. Her *Memorial de l'Art des Accouchements* is a well-known work.

BOJADOR', CAPE, a headland on the w. coast of Africa, in lat. 26° 7′ n., long. 14° 29′ w., forming the western extremity of the Jebel Khal (or Black mountains), a rocky ridge running eastward into the Sahara. In consequence of its extreme flatness, and the shoreward tendency of the currents, the coast, extending northwards to cape Nun, is one of the most dangerous that mariners have to encounter, and is frequently the scene of shipping casualties. The Portuguese doubled this cape in 1433, and from them it received its name B.C., signifying "a round cape."

BOJA'NO, a t. in the province of Campobasso, Italy, 13 m. s.w. of the t. of Campobasso. It is situated on the Biferno, in a deep gorge at the foot of the mountain-range of Matese; has a cathedral and some ancient remains. It has suffered greatly from earthquakes, and especially from one which occurred in 1805. Pop. 3500. B. is said to occupy the site of the famous Samnite city of *Bovianum*, but T. Mommsen thinks that Bovianum lay 20 m. to the north. Unsuccessfully besieged by the Romans in 314 B.C., it was taken by them in 311, and yielded immense spoils. Passing out of their hands, it was retaken by them in 305 B.C.; and once more reverting to its original owners, was a third time captured by the Romans, in 298 B.C. During the second Punic war, it formed the headquarters of the Roman army on more than one occasion; and in the great social war, the confederates, on the fall of Corfinium, made it their capital and the seat of their general council. Surprised by Sulla, it was retaken by the Marsic gen., Pompædius Silo. Cæsar established a military colony here; and afterwards, under the Roman empire, the town seems to have recovered considerably from the ruin which overtook it on the general devastation of Samnium.

BOJAR (pronounced *Boyar*), a word originally of the same meaning as Czech, Lech, and Bolgarin, i.e., free proprietor of the soil. The Bojars, in old Russia, were the order next to the knjazes or knjeses (ruling princes). They formed the immediate "following" of these princes, and bore somewhat of the same relation to them as the lesser English and Scottish knights of the feudal ages did to the great barons Percy, Douglas, etc. They had their own partisans, who served them as a kind of body-guard; they gave their services to a prince of their own choice, whom, however, they left again at their pleasure, and, in consequence of this, the knjazes could only secure their allegiance by the bestowment of privileges which were often abused. They held exclusively the highest military and civil offices, and were so universally looked up to by the mass of the people, that the most powerful rulers, even Ivan the cruel, considered it prudent to use this form of expression in their ukases: "The emperor has ordered it; the Bojars have approved it." Rank among the Bojars was always proportioned to length of state-service, and was

observed with the utmost rigor, so that the B. who had obtained an office, as it were, yesterday, looked down with proud contempt on him who only entered on his to-day. This singular mode of securing gradation of rank was called *miestniczestwo*. It was a most peculiar phenomenon of Slavic life, equally unlike feudalism and modern aristocracy, and must be regarded as a strictly national development. In their housekeeping the Bojars were excessively fond of splendor, and their contempt for the serfs or "lower orders" was immeasurable. In the lapse of time, many Chinese customs—as might be expected from their theory of rank—crept into their public life. Their power, and the respect which was paid them, acted as a wholesome check upon the otherwise unbridled authority of the princes; in consequence of which, the latter became their bitter enemies, and often sought to destroy their power. This was finally done by Peter the great, who abolished the order of Bojars by giving them a place among the Russian nobility, but, at the same time, stripping them of their peculiar privileges. The last B., Knjaz Ivan Jurjewicz Trubeckoj, died 16th Jan., 1750.

In Moldavia and Wallachia, Bojars still exist. They have a seat and vote in the council of the prince, and, as ancient history shows, exercise at times a most extensive influence.

BOKER, GEORGE HENRY, b. Philadelphia, 1824; graduated at Princeton; studied but did not follow the law. In 1847, he published a volume, *The Lesson of Life and other Poems*, and soon afterwards *Calaynos, a Tragedy*, which was acted in London. This was followed by *Anne Boleyn*, *Leonor de Guzman*, and *Francesca da Rimini*. A few years later he published his *Plays and Poems*, and in 1864, *Poems of the War*. In 1871, he was appointed United States minister resident at Constantinople.

BOKHA'RA (i.e., Eastland), or USBEKISTAN, is the name given to the countries of Independent Tartary, under the rule of the khan of Bokhara. The most important part of it formed the ancient Sogdiana. The extent of the khanate of B. has been constantly undergoing changes. Until recently, it included the whole basin of the Zar-afshan; but the Russians have now annexed Samarcand, and the lower basin of the river forms the essential part of the territory. The population of the present khanate has been estimated at from 1,000,000 to 2,500,000.

Only in the neighborhood of the rivers is cultivation possible. The rest of the soil of B. is composed of a stiff arid clay, interspersed with low sand-hills. B. belongs exclusively to the basin of the sea of Aral. It has only three rivers of any importance—the Amu or Jihun (anciently the *Oxus*), the Zar-afshan, and the Kurshi. Entering B. at Kushtuppa, the Amu flows through the country in a W.N.W. direction to the sea of Aral. Its banks in some parts are very fertile, especially in the neighborhood of Balkh. The Zar-afshan, which rises in the spurs of the Thianshan mountains, after a course of about 200 m., issues out into the plain near Samarcand, and thence fertilizes the district (Meeankal) to the city of Bokhara. Before reaching the city, it sends out a northern branch, which, after a fertilizing course of several miles, is absorbed in the sand. The southern branch passes B. to the N., and terminates in the lake of Kara-kool, a sheet of salt water about 25 m. in circumference, which is connected with the Amu by irrigating canals. The valley of the Zar-afshan is the richest as well as the most populous in Bokhara. The Kurshi has a course of about 60 m. before it is lost in the desert.

The climate of B. is moderate and healthy. Its geographical position secures B. the transit-trade between Russia and the S. of Asia. The rains usually commence and end with February. Violent sand-storms are frequent, and occasion ophthalmia among the inhabitants, who are also subject to the attacks of the guinea-worm, which penetrates into the flesh, causing great pain and annoyance.

Minerals are scarce. The sands of the Oxus yield gold. Salt deposits are numerous. Alum and sulphur are found in the vicinity of Samarcand, and sal-ammoniac in the mountainous districts. The other products include rice and cotton, wheat, barley, beet-root, vegetables, hemp—which is only used in the preparation of an intoxicating liquor called *bhang*—silk, fruits in immense abundance, and tobacco. The camel's thorn, a plant that grows luxuriantly in Samarcand and Kurshi, exudes a saccharine gum or manna, extensively used as sugar.

Sheep and goats form a great source of wealth. Camels are numerous and valuable; the horses are celebrated for their strength and endurance; and the breed of asses is excellent.

The industry includes the manufacture of silk-stuffs, cotton-thread, shagreen, jewelery, cutlery, and fire-arms. The population, like that of the other khanates of Turkestan, consists chiefly of Tajiks of Persian, and of Usbeks and Turkomans of Turkish origin.

B. was conquered by the Arabs in the beginning of the 8th c., who were dispossessed of it in 1232 by Genghis Khan. It fell into the hands of Timur in 1303, and was taken by the Usbeks in 1505, and it has since remained under the rule of the same Turkish race. During the 18th c., the khans were characterized by the worst abominations of eastern vice and fanaticism, and B. lost its pre-eminence among the khanates of Turkestan. The canals, which alone gave fertility to the country, were neglected; and large areas were again overspread by the desert; the population diminished; B. became a center of corruption and anarchy. About 30 years ago, it was ruled by the khan Nasrullah, a barbarous and incapable tyrant. It was he who caused, in 1843, the murder

of col. Stoddart and capt. Conolly, who went on a mission to B. Dr. Wolff, who visited the country in 1844, with a view to ascertain their fate, narrowly escaped with his life, after a detention of some months. After the capture of Tashkend by the Russians in 1865 (see TURKESTAN), a religious war was preached against the Russians, and the khan, Muzaffer-Eddin, was compelled to oppose them. He was defeated at the battle of Idjar on 20th May, 1866, and in May, 1868, Samarcand (q.v.), one of the most important cities of B., was taken. The command of the upper course of the Zar-afshan, which fertilizes the central part of B., placed the khan entirely under the power of Russia. On the 30th July, 1868, a peace was concluded, by which Samarcand was ceded to the czar, and stipulations were entered into, favorable to Russian trade. The treaty caused great dissatisfaction to the fanatic Mussulmans of B. They rose in rebellion, placing at their head khan Abdul Malik Mirza, the son and heir of the khan. The Russians, on the intercession of the khan, aided him; and in Oct. the rebels were defeated near Karchi. The rebel prince sought refuge in Afghanistan. Shere Ali, the ameer, gave him a warm welcome, and would have invaded B. had he not been restrained by lord Mayo, the Indian viceroy, who told him that England could not encourage him in any attack on his neighbors. While Shere Ali was meditating an invasion of B., Abdulrahman, a nephew of Shere Ali, who had married a daughter of the khan of B., endeavored to obtain Russian aid in invading Afghan Turkestan with a Bokharian army. But, in this case, Russia opposed the enterprise (see AFGHANISTAN). During the invasion of Khiva in 1873, the khan of B. efficiently assisted the Russians, and was rewarded by a large addition to his territory from the Khivan possessions on the right bank of the Oxus, under the treaty entered into between Russia and Khiva in July, 1873.—See *History of Bokhara from the Earliest Period to the Present Time*, by Arminius Vambery (1873).

BOKHA'RA (honored with the title of the "Treasury of Sciences"), a famous city of Central Asia, capital of the above khanate, is situated on a plain in lat. 39° 48′ n., long. 64° 26′ e., in the midst of trees and gardens. It is between 8 and 9 m. in circumference, and surrounded by embattled mud-walls, about 24 ft. high, and pierced by 11 gates. The houses, which are small, ill-lighted, and, with the exception of those belonging to the wealthy, uncomfortable inside, are built of sun-burnt bricks on a wooden frame-work; and the roofs of all are flat. The streets are ill-paved and very narrow, the widest barely sufficing for the passage of a loaded camel, while others are not more than 3 or 4 ft. across. The palace of the khan occupies an eminence of between 200 and 300 ft. in height in the center of the city. It is surrounded by a brick wall of 60 or 70 ft. high. The area includes, besides the palace, the harem, which is quite embosomed in trees; various public offices, the residences of the vizier and other important state functionaries, the barracks, royal stables, etc., and three mosques. The mosques, which are said (fabulously) to be 360 in number, necessarily form one of the greatest features of Bokhara. The most imposing one occupies a square of 300 ft., and has a cupola 100 ft. high, ornamented with blue tiles. Attached to it is a tower of about twice the height, built by Timur, from which criminals are hurled. B. is celebrated as a center of learning, and has, in addition to a vast number of schools, about 80 colleges, which are attended, it is stated, by about 5000 students. As a commercial town, B. is the most important in Central Asia. A canal intersects the city, but during the summer months it is often dried up, and water becomes very scarce. Pop. estimated at 70,000. See TURKESTAN.

BOKHARA CLOVER. See MELILOT.

BOL, FERDINAND, 1611–81; a Dutch painter, pupil and imitator of Rembrandt. Many of his paintings are to be seen in Amsterdam.

BO'LA BO'LA, or BONA BONA, or BORA BORA—the liquids *l*, *n*, *r*, being interchangeable, or rather, perhaps, undistinguishable in the languages of Polynesia—one of the Society islands, about 200 m. to the n.w. of Tahiti. It is in lat. 16° 32′ s., and long. 151° 52′ w., presenting a valuable landmark in a double-peaked mountain of considerable height. It contains about 1800 inhabitants; and it is about 24 m. round, beset by coral-reefs, some of them rising into islets.

BOLAN' PASS, a hollow route ascending in a generally w. direction from Sinde, on the Indus, through Beloochistan to Candahar and Ghuzni. Its entrance and its outlet are respectively 800 and 5793 ft. above the level of the sea. The total ascent, therefore, is about 5000 ft., which, on a length of barely 55 m., gives an average of fully 90 ft. to the mile. Along the bottom of the pass descends a torrent, which the road generally follows. The route, without being impracticable, is highly defensible in a military point of view. It is bounded throughout by eminences of at least 500 ft. in height; and yet, in 1839, a division of the British army, which invaded Afghanistan, accomplished, with a heavy train of artillery, the whole distance in six days. From the outlet of the B. P. there is no fall towards the w., the spacious plateau of the Dasht-i-Bedowlut retaining the level of the upper extremity.

BOLAS, a missile used by South American Indians in capturing wild cattle. It consists of two leather balls, covered and united by a narrow but stout thong. The cattle-hunter holding one ball swings the other around his head until proper momentum is gained, and then launches the B. at the legs of the animal, which it instantly ties

together, rendering him helpless. The B. has been effectively used in war. If the balls be of iron or lead, it may be thrown a great distance.

BOLBEC, a well-built t. of France, in the department of Seine-Inférieure, about 18 m. n.e. of Havre, on the railway between that place and Paris. B. is situated on a stream of the same name, which supplies the water-power for several mills, where woolen, linen, cotton, and chemicals are manufactured. Pop. '76, 9778.

BOLE is the term applied to an earthy mineral resembling clay in structure, and consisting essentially of silica, alumina, and red oxide of iron. It occurs in nests and veins in basalt and other trap-rocks, in Scotland, Ireland, France, Armenia, Italy, Saxony, and South America. It feels more or less greasy when placed between the fingers; is of different colors—yellow, red, brown, and black; has a dull resinous luster, but a shining streak; is readily friable; and often adheres to the tongue when brought in contact therewith. *Armenian B.* has a red tint, is often used for coloring false anchovies, and is also employed in coloring tooth-powders. *Lemnian earth* is the B. from the island of Lemnos, is red in color, and was at one time prescribed by medical men as a tonic and astringent medicine; and acted beneficially, no doubt, from the large percentage of oxide of iron present. The boles which are employed in veterinary practice in Europe are generally made from Armenian bole. The savage tribes in South America eat B. to allay the pangs of hunger; and the inhabitants of Java use cakes made of it, under the name of *tanaampo*, when they wish to become slender. When B. is calcined, it becomes hard; and when afterwards levigated, a coarse red kind is used as a pigment in Germany under the names of *English red* and *Berlin red*. *French B.* is pale-red; *Bohemian B.*, reddish-yellow; *Silesian B.*, pale-yellow; and *Blois B.* is yellow.

BOLE'RO, a Spanish national dance, mostly in the time of a minuet, with a sharp, marked, and peculiar rhythm. It is accompanied with the castanets and the cithern, and frequently with the voice; and the dancer in the movements seeks to represent the different degrees of feeling from coyness to the highest ecstasies of love.

BOLE'TUS, a genus of *fungi* (q.v.), of the division *hymenomycetes*, subdivision *polyporei*. The older botanists included in it the numerous species now forming the genus *polyporus* (see AMADOU, DRY ROT, and POLYPORUS) and other genera; but even as now restricted, it is a very extensive genus. Most of the species resemble the common mushroon and other species of *agaricus* in form; but instead of gills, the under-side of the cap (*pileus*) is occupied by a layer quite distinct from it in substance, and pierced by pores so as to be composed of a multitude of small tubes united together, on the inside of which the *spore-cases* or seed-vessels are produced. Some of the species are edible. *B. edulis* is much used in France, also in Germany, Hungary, Russia, etc. It is the *ceps ordinaire* of the French markets. It grows on the ground in thin woods of oak, chestnut, or beech, and sometimes in mountainous districts, in places covered with moss, heath, or grass. In moist warm summers, it sometimes appears in prodigious quantities. It has also been partially cultivated, by inclosing a portion of a wood, and watering the ground with water in which the plant has been steeped, thus, in fact, sowing its minute seeds or spores. In Britain, it is comparatively rare. The cap is smooth, 6 or 7 in. across, with a thick margin, varying in color from light-brown to brownish-black; the tubes at first white, then yellow, and finally yellowish-green; the stem thick and solid, beautifully reticulated. The tubes are removed along with the skin and stem, and only the flesh of the cap is eaten, which is firm, white, delicate, of agreeable smell, and is prepared like the common mushroom, dried to flavor sauces, ragouts, etc., or eaten raw with salt and pepper. It is wholesome and nutritious, and this is certainly to be reckoned one of the very best of the edible fungi, and deserves much more attention than it has yet received in Britain.—*B. scaber* is another edible British species, but much inferior.—*B. æneus* is the *ceps noir* of the French markets, and *B. aurantiacus* is the *gyrole rouge* or *roussile*. They are used like *B. edulis*.

BOLEYN, ANNE, wife of Henry VIII., king of England, was b. about the year 1507. Her father was sir Thomas B., afterwards viscount Rochford and earl of Wiltshire; her mother, the daughter of the duke of Norfolk. In her seventh or eighth year, Anne B. went to France with Mary, sister of Henry VIII., and remained in France after Mary—who had married Louis XII.—returned to England as a widow, under the protection of queen Claude, wife of Francis I., who was much pleased with her beauty and liveliness. It is not known exactly when she returned to England, but it is certain that she was one of queen Catharine's maids of honor in 1527, in which year the king seems to have conceived and expressed a passion for her, to which she apparently refused to listen on other condition than that she should become his wife. Henry's religious scruples regarding the lawfulness of his marriage with Catharine, whether he had entertained them before (as is alleged) or not, certainly became much more impatient than they had hitherto been—much too urgent, indeed, for the slow decision of the court of Rome. He, accordingly, without waiting for the award of his holiness, entered privately into matrimonial relationship with Anne B., in Jan., 1533, or, as some authorities have it, in the Nov. previous. In Sept., 1533, the princess—afterwards queen—Elizabeth was born. The new queen, naturally light and gay of heart, and educated at the French court, where these qualities were likely to be developed to the utmost, conducted herself

towards the courtiers with an easy familiarity not customary in England for one in her position. Concerning the first two years of her married life, we have little information, only it is known that she was favorable to the reformation, and promoted a translation of the Bible. In 1535, the affections of the king appear to have become alienated from her. According to some historians, the amorous monarch had already fixed upon a successor to Anne B.; others make out that his passion had nothing to do with her death, and assert that Henry contracted his unseemly hasty marriage with Jane Seymour solely at the request of the peers and privy council. If this latter statement could be thoroughly relied on, it would no doubt tell strongly against Anne B., as there would then be no apparent motive for Henry seeking her condemnation if she were innocent. Between conflicting historians, one may well hesitate to decide on this point. In Feb., 1536, the queen gave birth to a son, still-born. The king now became more and more estranged from her; and her freedom of manners had given but too good grounds for her enemies to speak evil of her. On the 1st of May, the annual tournament was held at Greenwich, in presence of the king and queen. The tilting had commenced, the challengers being viscount Rochford, brother to the queen, and sir Henry Norris, one of the gentlemen of the king's privy chamber. Suddenly the king rose—his outward bearing manifesting inward disturbance—left the tourney, and with a small party rode up to London, leaving the queen at Greenwich. The popular account is, that the king's sudden departure was occasioned by the discovery of a handkerchief belonging to the queen in the possession of Norris; but the necessity for any such romantic and sudden cause of jealousy is obviated by the fact, that, in the previous week, a commission, composed of members of the privy council, had been secretly engaged in examining into charges of adultery against Anne; and two of her alleged accomplices in the crime, sir William Brereton, a gentleman of the king's household, and Mark Smeton, a musician at court, had been already arrested. The queen remained at Greenwich that night. On the following morning, she was examined before the privy council, under the presidency of the duke of Norfolk, her uncle, but a bigoted Roman Catholic, and protested her innocence. In the afternoon, however, she was sent up the river to the Tower. Sir Henry Norris, and sir Francis Weston, another courtier, along with Smeton, were also examined, and all at first declared their innocence of the charge imputed to them; but afterwards the musician confessed to the crime. Norris, too, it is said, made a like confession; but he indignantly repudiated it the next day, on the ground that he had been entrapped into it unwittingly. In the Tower, the queen's every action and word were watched and reported on; but anything she said while a prisoner seems quite as compatible with innocence as guilt, although her words unquestionably prove her to have exhibited a dangerous levity towards the courtiers; for which, however, her French education may be held to account. Her letter to Henry, written on the 6th of May, speaks decidedly in her favor. On the 10th of May, the grand jury of Middlesex found a "true bill" on the indictment, which charged the queen with committing adultery with no less than five persons, including her own brother, lord Rochford, and of conspiring with them, jointly and severally, against the life of the king, the adultery being alleged to extend over a period of nearly three years. On the 11th, the grand jury of Kent found a true bill likewise. On the 12th, the four commoners, Brereton, Weston, Norris, and Smeton, were found guilty, the last confessing to the charge of adultery only, the other three pleading not guilty to both charges. On the 15th, the queen and her brother were tried before 27 peers, the president being the duke of Norfolk. They affirmed their innocence; but they were found guilty, and condemned, the queen to be burned or beheaded on the Tower green. On the 17th, Smeton was hanged, and the other four beheaded; general protestations of unworthiness by them at the hour of death being regarded by some historians as evidence of particular guilt. On the 19th, the queen was beheaded—having previously confessed to Cranmer some engagement that rendered her marriage with the king illegal—with her last words praying a blessing on Henry, who, she said, had ever been to her a good and gentle lord, but making no confession of guilt.

It is difficult, if not impossible, to form anything like a just and satisfactory estimate of the character of Anne B.; historians, for the most part, having made her but a lay-figure upon which to hang the drapery of religious partisanship, or to display the colors of individual sympathy. That, with the courtiers, she maintained not that dignity which becomes a queen, but was unguarded in manner, and thoughtlessly free of speech, there can be no question; there is much room to doubt that she was guilty of the heinous offenses laid to her charge. A woman who resisted for years the criminal solicitations of the king, was not likely to seduce systematically grooms of the chamber; nor is it at all probable that one so diabolically bad as she must have been, if the charges alleged against her were true, could be so utterly devoid of that cunning necessary to the practice of successful wickedness. Again, it seems scarcely possible that such an extensive system of conspiracy and crime could have been carried on for nearly three years without being noticed by the lynx eyes, and blown upon by the calumnious tongues, of her numerous and powerful enemies, especially if there were truth in the statement in the indictment, that her accomplices were "very jealous of each other." On the other hand, it appears monstrous to suppose that 70 noblemen and commoners of England, before whom the case in its various stages came, against most of whom even slander had not a word to say, should have deliberately condemned a queen and five of her asso-

ciates, and their own, without conclusive evidence. In the absence of the evidence which they had before them, however, it appears to us that the proper verdict for history to pronounce is the intermediate one of *not proven*.

BOLGRAD', a t. in Moldavia, 28 m. n.n.w. of Ismail; pop. '66, 9114. B. was formerly in Bessarabia, but was ceded to Moldavia by Russia in the Paris treaty.

BO'LI, or BOLY, a t. of Asia Minor, in the pashalic of Anatolia, on the left bank of the river Boli, and on or near the site of the Roman Hadrianopolis, 136 m. e. from Constantinople. The town occupies an eminence, at the extremity of a fertile plain. It has several mosques. There are mineral springs near the town, and baths much frequented by the Turks. B. is on the caravan route from Constantinople to Erzeroum. Pop. 10,000.

BOLINGBROKE, HENRY ST. JOHN, Viscount, b. at Battersea, Oct. 1, 1678, was educated at Eton and Oxford, after which he traveled for about two years on the continent, and in 1700, shortly after his return, married the daughter of Sir Henry Winchcomb, from whom, however, he soon separated. Up to this period, he was chiefly notable for his extreme dissipation; but having entered parliament in 1701, he devoted himself to politics, and joining the tory party, soon made himself prominent as an orator. In 1704, he was made secretary at war. This office he retained till 1708, when the whigs came into power, after which he retired from politics, and gave himself up to study, but still retained great influence as the queen's favorite counselor. On the fall of the whig party in 1710, he was made secretary of state for foreign affairs. In 1712, he was called to the house of lords by the title of viscount Bolingbroke, and in 1713, against the wish of nearly the entire nation, concluded the peace of Utrecht. Having previously quarreled with his old friend Harley—now earl of Oxford, and his most powerful rival—he contrived his dismissal in July, 1714, and immediately proceeded to form a strong Jacobite ministry, in accordance with the well-known predilections of his royal mistress, whose death, however, a few days after, disconcerted his dangerous and unprincipled schemes. The accession of George I. proved a death-blow to his prospects. On the 28th of Aug., he was deposed from office; in Mar., 1715, he fled to France; and in Aug. of the same year was attainted. For some time he held the office of secretary of state to the pretender; but his restless and ambitious spirit yearned for the "large excitement" of English politics. His efforts to obtain a pardon not proving in the mean time successful, he retired to a small estate which he had purchased near Orleans. In 1718, his first wife died, and in 1720 he married the rich widow of the marquis de Vilette. A judicious use of this lady's wealth enabled him to return to England in Sept., 1724. His property was restored to him, but he was never permitted to take his seat in parliament. He therefore betook himself to his villa at Dawley, near Uxbridge, where he occasionally enjoyed the society of Swift, Pope, and others of his old friends with whom he had corresponded in his exile, and where he diversified his moral and metaphysical studies by his attacks on the ministry in his periodical, the *Craftsman*, in which the letters forming his *Dissertation on Parties* first appeared. In 1735, finding his political hopes clouded forever, he went back to France, in deep chagrin, and continued there till 1742. During this second residence abroad, he wrote his *Letters on the Study of History*, in which he violently attacked the Christian religion. He died, after a long illness, 1751. His talents were brilliant and versatile; his style of writing was polished and eloquent; but the fatal lack of sincerity and honest purpose which characterized him, and the low and unscrupulous ambition which made him scramble for power with a selfish indifference to national security, hindered him from looking wisely and deeply into any question. His philosophical theories are not profound, nor his conclusions solid, while his criticism of passing history is worthless in the extreme. He was one of those clever, unscrupulous men, unhappily too common, who forget that God has something to do with the government of this world as well as themselves, and who, in spite of all their ability, can never see that swift destruction treads, like Nemesis, on the heels of those who dare to trifle with the interests and destinies of a great people. His collected writings were published by Mallet (5 vols., Lond. 1753–54).

BOLIVAR, a co. in Mississippi on the M. river, 800 sq.m.; pop. '70, 9732—7816 colored. The land is low and swampy, and little cultivated. Co. seat, Rosedale.

BOLI'VAR, one of the United States of Colombia, lying on the Caribbean sea; 21,345 sq.m.; pop. '71, 247,100; chief town and capital, Carthagena. The country is level and covered with forests. Magdalena river forms its w. boundary.

BOLI'VAR CITY. See ANGOSTURA, *ante*.

BOLI'VAR, SIMON (named *El Libertador*, for having rescued South America from the Spanish yoke), was born at Caracas, July 25, 1783, descended from a noble and wealthy family. Having studied law at Madrid, he traveled extensively on the continent, married, and returned to his native country, where his wife soon after died. On her death, he again visited Europe, and in 1809 the United States, from which he returned with the determination to free his country from foreign despotism. Arriving at Venezuela, he at once associated himself with the patriots there; and after the insurrection of Caracas, April 19, 1810, he was sent to London with a view to interest the British cabinet in their aims. The British government, however, declaring its neutrality, B. speedily returned,

and fought under gen. Miranda in several successful engagements. The Spaniards having again obtained possession of Venezuela, B. had to flee to Curaçoa. He did not, however, remain long inactive. Sympathized with by the republican president of New Granada, he raised a force of volunteers; defeated the Spaniards several times, his army increasing with each victory; and on Aug. 4, 1813, entered Caracas as a conqueror, was hailed as the liberator of Venezuela, and made absolute dictator in all civil and military affairs. After defeating the Spaniards in several engagements, he was himself worsted at the battle of La Puerta, and again in Aug. at San Mateo, where he had a narrow escape. He now went to Carthagena, and afterwards to Kingston, in Jamaica, where an assassin, hired by the Spaniards, tracked his steps, but, by mistake, murdered his secretary. Having visited Hayti, and assembled there the insurgent refugees, he landed with them on the island of Margarita, Dec., 1816, where he convoked a congress, instituted a government, proclaimed the abolition of slavery, and immediately manumitted his own slaves. The following two years were marked by successes over Morillo. In Feb., 1819, a congress was opened at Angostura, and B., chosen president, was armed with the power of dictator. Having conducted his forces over the almost impassable Cordilleras to New Granada, he achieved the victories of Tunja and Bojaca, and soon afterwards declared New Granada united with Venezuela as a republic, under the name of Colombia. The office of president was conferred upon him. 1822 saw the new republic completely cleared of royalist troops, and B. was summoned the same year to help the Peruvians, and was named dictator of Peru. After two years' fighting, the Spaniards were driven from Peru also.

B. now made a tour through the southern provinces of Peru, where he was hailed with every demonstration of rejoicing. The name of the country was changed in his honor to Bolivia (q.v.), and a million of dollars was given him, which he devoted to the liberation of 1000 slaves. The Bolivian code was adopted by Bolivia in Dec., 1826, and in the following year by the congress of Lima, where B. was made president for life. In the meantime, dissatisfaction prevailed in Colombia, to which he returned, and, notwithstanding some dissent, was confirmed in the presidency in 1826, and again in 1828. About this time a conspiracy threatened his life, but was suppressed by the execution of the leaders and the banishment of seventy accomplices. Meanwhile, his famous code was renounced in Peru, and B. was rejected from the presidency. In 1829, Venezuela separated itself from the republic of Colombia, which was generally disturbed by faction, and B.'s ambition was loudly denounced. B. accordingly laid down his authority in Jan., 1830, notwithstanding earnest entreaties to retain it, and retired, in failing health, to Carthagena. The congress of Bogota voted him a pension of 30,000 piastres, and awarded him the thanks of the Colombian people. He died at San Pedro, Dec., 1830, having, shortly before his death, written a farewell address to the people of Colombia, in which he vindicated his character from the aspersions that had been cast on it, and complained bitterly of ingratitude. The war of liberation, and the peculiar elements with which he had to deal, compelled him to assume dictatorial power; but there is no proof that he was ever insincere in his devotion to liberty. His property was mainly devoted to the service of his country. He has been described as the Washington of South America. Like other great men, he was rightly estimated after his death. By a resolution of congress, New Granada, 1842, his ashes were removed with great pomp from Santa Marta to Caracas, where a triumphal arch was erected to his memory.

BOLIV'IA, or UPPER PERU, a republican state on the w. side of South America, deriving the former name from Bolivar (q.v.), and the latter from the fact that it had originally been subject to the Incas. It extends between lat. 10° and 23° s., and long. 57° 30′ and 70° 10′ w., touching the Pacific on the s.w., Peru on the w. and n., Brazil on the n. and e., and lastly, the Plate Provinces and Chili on the s.; its area, now better defined than formerly, by treaties made with Chili and Brazil in 1866 and 1867, being about 536,000 sq. miles. In 1861, the pop. of European origin was estimated to be 1,742,352; later returns give 2,000,000. The aboriginal element is by far the most important. B. is divided into the departments of La Paz, Potosi, Oruro, Chuquisaca or Sucre, Cochabamba, Beni, Santa Cruz, Tarija, and Atacama. Hydrographically, the country may be regarded as unique. Its maritime territory, known, in fact, as the Desert of Atacama, is a sandy waste, which, with the inconsiderable exception of the Loa, does not send a single stream that is worthy of notice into the Pacific. Again, the plateau, chiefly Bolivian, of Titicaca, shut out alike from either ocean, loses its entire drainage in the lake of Paria. Lastly, the region to the e. of the Andes is a cradle at once of the Plata and the Amazon, gathering for the former the Pilcomayo and the Paraguay, and for the latter the Beni, the Mamore, and the Guapai. In each section of B., the hydrography may be said to be a clue to the rainfall. On the almost riverless shore of the Pacific, the air is nearly as dry as the earth; to the e. of the mountains, the trade wind vapors from the Atlantic are copious enough not only to feed, but to flood the parent streams of the mightiest rivers on the globe; and within the valley of Titicaca, which has a minimum height of 12,441 ft., the clouds barely supply the comparatively scanty evaporation of so lofty a surface. With regard to temperature, B., almost entirely a tropical region, may claim to embrace all the zones in the world. Each locality, excepting, of course, the sandy wastes on the Pacific, has its own peculiar

vegetation. Even the arid brows of the Andes yield a coarse grass, which forms the favorite food of the guanaca, llama, alpaca, and vicunha—animals almost as independent of water as the camel. The table-land of Titicaca produces abundantly maize, rye, barley, and wheat. Hitherto, however, B. has been remarkable mainly for its mineral productions. The silver mines of Potosi, after having, on a well-founded estimate, completed the full tale of 2000 millions of dollars, are believed to be inexhaustible; while gold, lead, tin, salt, sulphur, niter, and copper are abundant. The foreign trade labors under heavy disadvantages. In the days of Spanish connection, it was almost exclusively carried on—though quite as much by land as by water—along the line of the Plata; but since then, it has found its most convenient channel through the Peruvian marts of Arica and Tacua. With the aid of steam, however, the external traffic might make for itself great highways of the Plata and the Amazon. The imports, confined to articles of the highest value or of the first necessity, are principally iron, hardware, and silks; and the exports, besides the precious metals, are copper, guano, niter, cacao, Jesuits' bark, skins, tobacco, and native manufactures. The total imports in 1875 were valued at £1,150,000; the exports at £1,000,000. In 1874, B. exported to Great Britain, copper valued at £104,638; silver, at £103,806; niter, at £116,195. The constitution of the republic, as founded by Bolivar, has suffered important modifications. According to the constitution, the executive is vested in a president, elected for four years, while the legislature consists of a congress of two chambers, called the senate and the house of representatives, both elected by universal suffrage; but in reality, the fundamental law of the republic requiring the election of the president every four years has fallen into disuse; and since the presidency of Marshal Santa Cruz (from May, 1828, to Jan., 1839), the history of B. is a history of military insurrections, the supreme power having been almost invariably seized by successful commanders. In 1873–74, the estimated revenue was £585,915, and the expenditure £901,101. The republic is burdened with an internal debt of £1,600,000, and a foreign debt, consisting of a six per cent loan of £1,700,000 nominal capital—issued at the price of 68—contracted in England in 1872, "to subsidize the National Bolivian Navigation Company." The army consists of about 3000 men. The seat of the executive government, formerly La Paz, was transferred in 1869 to Oruro. In 1879 a war broke out between Chili and B. allied with Peru. There are three short railways in Bolivia.

BOLKHOV', an ancient t. of Russia, in the government of Orel, about 30 m. n. of the city of the same name. B. is situated on the Nougra, is chiefly built of wood, has upwards of 20 churches, besides a monastery and nunnery. Its manufactures consist of gloves, hats, hosiery, leather, etc., and it has a trade in tallow, hemp, hides, and oil. Pop. '67, 18,491.

BOLL, an old dry measure in Scotland, varying in quantity according to locality and the article measured. It is sufficient to say that a B. of oats is equal to six bushels, or six-eighths of an imperial quarter. Although superseded by imperial measures, the B. is still very commonly in use; but, as in the case of all old weights and measures, bargains by it cannot be legally enforced. See WEIGHTS AND MEASURES.

BOLLAN, WILLIAM, d. 1776; an English lawyer, son-in-law of gov. Shirley of the colony of Massachusetts, and the agent to obtain from England the money advanced by the colony for the expedition against cape Breton. He favored conciliation toward the colonies, and wrote on American affairs; among other works, *Freedom of Speech, and Writing upon Public Affairs Considered,* and *Ancient Rights to the American Fishery Examined and Stated.*

BOL'LANDISTS, an association or succession of Jesuits by whom the *Acta Sanctorum* (q.v.), or Lives of the Saints of the Christian Church, were collected and published (1643–1794). They received their name from JOHN BOLLAND, b. in the Netherlands 1596, d. 1665, who, with the help of Gottfried Henschen, edited the first 5 vols., containing the month of Jan., in two vols., published in 1643, and the month of Feb., in 3 vols., published in 1658. The project had been undertaken by a Flemish Jesuit, Herbert of Rosweyd, and on his death, in 1629, his collections were intrusted to Bolland, who established himself in Antwerp, opened a correspondence all over Europe, and associated young men of his order with himself in the work. Several distinguished names are ranked among the B., as Gottfried Henschen (died 1681), Daniel Papebroek (1714), Conrad Janning (1723), Peter Bosch (1736), Suyskens (1771), Hubens (1782), Dom Anselmo Berthod (1788), and Jos. Ghesquière (1802). The abolition of the order of Jesuits in 1773 caused the removal of the Bollandist society to the monastery of Candenbeg, in Brussels, till the persecutions under Joseph II. brought about its dissolution. In 1789, the abbey of Tongerloo, in Brabant, took up the colossal task of carrying on the *Acta Sanctorum;* but scarcely had the 53d vol. appeared, in May, 1794, when the French occupation put an end to the work. It was not till 1837 that a new Bollandist association of Jesuits was formed, under the patronage of the Belgian government, which set aside a yearly sum of 6000 francs for this object. In 1845, this new society published, in two parts, the 54th vol. of the work, containing, among others, the life of St. Theresa, extending to 671 folio pages. Other volumes have since appeared, and more are in preparation, so that there is room to hope that at least the next generation may see the completion of this vast work, of which Gibbon has truly said, that "through the medium

of fable and superstition it communicates much historical and philosophical instruction." M. Guizot, having ascertained that the 3 vols. for April contain 1472 lives, estimates that the 53 vols., published before the French revolution suspended the progress of the undertaking, contain more than 25,000 lives of saints.

BOL'LINGER, a co. in s.e. Missouri on Little river; intersected by the St. Louis and Iron mountain railroad; 450 sq.m.; pop. '70, 8162. It is level with fertile soil; productions chiefly agricultural. Co. seat, Dallas.

BOLOGNA, a province of the kingdom of Italy, formerly one of the delegations of the papal states. It is bounded n. and e. by the provinces of Ferrara and Ravenna, and w. and s. by those of Modena and Florence. The area of the province is 1374 sq.m.; pop. in '71, 439,166. Sloping gradually up from the plains of Lombardy in the n., its surface becomes mountainous in the s., which is traversed by offsets from the Apennines. B. is well watered, and the streams are extensively used in the irrigation of rice-fields. It is very productive, yielding corn, wine of middling quality, olive-oil, fruit, vegetables of all kinds, hemp, flax, and saffron. Silk-worms are reared in great numbers. Marble, chalk, and gypsum are the mineral products; hemp, rice, and silk the principal articles of trade.

BOLOGNA, one of the most ancient cities of Italy, is beautifully situated on a fertile plain at the foot of the lower slopes of the Apennine mountains, in lat. 44° 30′ n., long. 11° 21′ e. It is inclosed by a high brick-wall, some 5 or 6 m. in extent, but without fortifications; the canal of Reno intersects it, and, on either side, the rivers Reno and Savena sweep past its walls. B. was, next to Rome, the most important city of the papal states. The streets in the newer parts of the city are spacious and well paved, with rich and varied colonnades, affording shelter alike from sun and rain; in the older portion, the streets are narrow, crooked, and dirty, and the arcades correspondingly low and gloomy. The city is adorned with many fine palaces of the nobility, which are rich in fresco-paintings by the great masters. Pre-eminently worthy of notice is the Piazzo Maggiore, "the Forum of B. in the middle ages," which includes, among other fine buildings, the Palazzo Maggiore del Pubblico, and the Palazzo del Podestà. Among the fine frescoed rooms and galleries of the former, that of the Sala Farnese is the most imposing; the latter is interesting as having been the prison and death-scene, in 1272, of Enzius, the son of the emperor Frederick II., and also as containing the archives of the city. The great feature of B., however, is its religious edifices, which are remarkable both for the beauty of their architecture, and the abundance and splendor of the art-treasures they contain. It has more than 70 churches, the most remarkable of which are San Stefano, which is rich in relics, ancient tombs, and Madonnas, Lombard architecture, and Greek frescoes of the 11th and 12th centuries; San Petronio—which, though unfinished, is the largest church in B.—a noble specimen of Italian Gothic, with a meridian traced on the floor by the astronomer Cassini, and numerous splendid bass-reliefs by Jacopo della Quercia and Tribolo, as well as masterpieces by other artists both in sculpture and in painting; San Domenico, with works by Michael Angelo and Niccolò di Pisa, and many other eminent sculptors, and paintings and frescoes by Guido, Francia, Lodovico Caracci, Marchesi, Simone da Bologna, Colonna, and others; and the cathedral dedicated to St. Peter, also rich in works of art, and interesting historical associations, which, indeed, cluster around all the structures mentioned. In the center of the city are two remarkable leaning towers, constructed about the beginning of the 12th c.; the tallest, called the Asinella, has a height of 256 ft., with, in 1706, an inclination of 3 ft. 2 inches. In 1813, a careful measurement showed that this inclination had slightly increased. The other tower, the Garisenda—which is alluded to in the 31st canto of Dante's *Inferno*—has an elevation of 130 ft., with a lean of 8 feet. The university of B. is said to date its origin from the 5th c., when it was founded by Theodosius II., and to have been afterwards restored by Charlemagne. It was not, however, until the 12th c., when it was founded anew by Irnerius or Wernerus, that it attained celebrity. Its reputation during that century was so great, chiefly on account of its school of jurisprudence that students from all parts of Europe were attracted to it. In 1262, the number receiving instruction is stated to have been 10,000, and it was found necessary to appoint professors specially for the students from each country. The university is also celebrated as the first school for the practice of dissection of the human body, as well as for the fact that, for centuries learned female professors have prelected within its walls. The famous linguist, cardinal Mezzofanti, was a professor here. Though the number of students is now comparatively small, the university of B. still holds a first place among Italian educational institutions. Medicine is now the principal study. The university library contains 200,000 vols., and 6000 MSS., 20,000 vols. having been presented by Benedict XIV. Many of the books are very rare and valuable. In the church of San Domenico there is a public library of 90,000 vols., accessible on holidays, when all others are closed. The Accademia delle Belle Arte is particularly rich in the works of those native artists who founded the far-famed Bolognese school of painting, and it has also some fine specimens of other schools. Besides being the birthplace of those painters that have made its name illustrious, B. gave to the pontifical chair Honorius II., Lucius II., Gregory XIII., Innocent IX., Gregory XV., and Benedict XIV.

B. has some important manufactures, including silk goods, velvet, crape, wax-candles, musical instruments, chemical products, paper, and sausages almost as celebrated as its paintings. Pop. '71, 89,104.

B. owes its origin, which is said to be much more remote than that of Rome, to the Etruscans, by whom it was called *Felsina*. It afterwards fell into the hands of the Boii, from whom it passed to the Romans, who made it a colony, under the name of *Bononia* (189 B.C.). In 53 A.D., it was nearly destroyed by fire, but was restored by Claudius. After the fall of the Roman empire, it passed into the hands of the Longobards, from whom it was taken by the Franks. Charlemagne made it a free city, and its independence was confirmed by a charter from Henry V., in 1112, which also invested the citizens with the choice of their own judges, consuls, and magistrates. The feuds of the Guelph and Ghibeline factions led to the downfall of the republic, and the supremacy of the papal see, B. being made a delegation in 1513. In 1796, B. was taken by the French, and was constituted the chief town of the Cispadane republic; and afterwards, when the kingdom of Italy was established, capital of the department Del Reno. It reverted to the pope in 1815. After that time, B. made several efforts to throw off the authority of the pope. One, in 1831, was successful, but the papal authority was restored in the following year. In 1848, the Austrians attempted to obtain possession of B., but were repulsed. In the following year, however, they succeeded in capturing the city after a siege of ten days. B. was then, like the rest of the Romagna, declared to be in a state of siege, and was made the head-quarters of the Austrian second Italian corps. From the commencement of the Italian campaign of 1859, the Bolognese gave an active sympathy to the national cause; and long before the peace-negotiations at Zurich had been brought to a close, they had intimated their intention of placing themselves under the rule of Victor Emmanuel, as a part of the new kingdom of Italy. Notwithstanding the menaces of the Vatican, they persisted in their resolve; and when the question of "annexation to Piedmont, or separate government," was submitted to the universal vote of the people, in Mar., 1860, the votes for annexation exceeded those for separate government in the proportion of 1000 to 1.

BOLOGNA, GIOVANNI DA, 1524–1608; an Italian sculptor and architect, whose only superior was Michael Angelo. He designed the fountain in Bologna and its celebrated figure of Neptune. At Florence may be seen his "Rape of the Sabine Women," and a bronze statue of Mercury. He was extensively employed in important public works.

BOLOGNA PHIAL, or PHILOSOPHICAL PHIAL, is a short, thick, narrow glass vessel, close at one end, and open at the other, which the glass-blower prepares from each pot of metal before employing it in the fashioning of tumblers, glasses, bottles, etc. See GLASS. It serves the purpose of enabling the glass manufacturer to judge of the color and other conditions of the fused glass or metal; and as the jar is not subjected to annealing, it is very friable, and a small angular fragment of any mineral allowed to drop into it, at once causes it to fly in pieces. It is curious to notice, however, that a B. P. will bear a very heavy blow on the outside without being fractured.

BOLOGNA STONE, an old popular name of a radiated variety of heavy spar, or sulphate of barytes (see BARYTES), found near Bologna, which is phosphorescent in the dark. It has been also called Bologna phosphorus; but this name more strictly belongs to it when calcined, pulverized, and made into little cakes with gum-water. These, after being exposed to a vivid sunlight, are very phosphorescent, either in the air or under water.

BOLOGNESE SCHOOL OF PAINTING. Franco, who was commended by Dante for superiority in missal-painting, and who has been called the Giotto of his school, is the supposed founder of the style of the Bolognese painters of the 14th century. Many of their now fading works exist in the church di Mezzaratta, a gallery, as it were, of ancient specimens, which is to this era of the Bolognese school what the Campo Santo at Pisa is to that of the Florentines. About 1500, the most prominent name is Lippo Dalmasio, some of whose works remain. Malvasia relates, with reference to one in the church of S. Procolo, that he heard Guido extol its purity and grandeur of expression, and assert that no modern painter could infuse so holy a feeling into similar subjects. Francesco Francia, who was contemporary with Raphael, and survived him some years, is celebrated as a painter who succeeded beyond most others in giving an expression of sanctity and purity to his madonnas, and a letter of Raphael's is extant in which this merit is particularly alluded to. His eulogists, however, have vainly endeavored to exalt him to a level with Raphael or Titian. Niccolo dell' Abate is associated with the Bolognese painters by some works at Bologna, by his joint labors with Primaticcio at Fontainebleau, and by the extravagant compliment paid to him in a sonnet by Agostino Caracci as uniting in himself all the excellences of all the great masters. Pelligrino Tibaldi, a pupil of Michael Angelo, is another celebrated name. The Caracci, of whom we shall soon speak, honored him with the appellation of "the reformed Michael Angelo." Baroccio led the way, about 1565, in including Correggio among the great models to be imitated, and we find that Ludovico Caracci, and his younger cousins Agostino and Annibale Caracci united their efforts to introduce a new style patterned in some respects after that great master. They founded a school of instruction which exerted a great influence. The fame of the Caracci was soon estab-

lished by their works; but the opposition of the abettors of the old school was not silenced until the frescos in the Palazzo Magnani were executed. The constant reference of these masters to nature was the point of objection on the part of the old school. Annibale Caracci painted in various churches in Rome; but his great work, the monument of his powers and the specimen of the school most frequently quoted, and in which Agostino assisted, is the series of frescos in the Farnese palace. The followers of Ludovico at Bologna were true to the founder of the school, and posterity seems to have decided that he was more original than Annibale. Sir Joshua Reynolds praised "his unaffected breadth of light and shadow, the simplicity of the coloring," and "the solemn twilight" diffused over his pictures, as corresponding better with grave and dignified subjects "than the more artificial brilliancy of sunshine which enlightens the pictures of Titian." Indeed, the principles and practice of these Bolognese masters and their scholars superseded for a time every other style in Italy. Among the numerous scholars of the Caracci, Domenichino holds the first rank. He was declared by Poussin to be the greatest painter after Raphael, and by some modern critics he has been preferred to the Caracci themselves. Among the other eminent painters of the Bolognese school are Guercino, Lanfranco, Tiarrini, Lionello Spada, Cavedone, and Carlo Cignani. During the present century the school has lost something of its former high rank. The British national gallery contains more than twenty pictures by artists of this school.

BOLOR-TAGH', a supposed lofty mountain-chain of Central Asia, extending from lat. 35° to 45° n., and from long. 70° to 75° e., which was said to divide Turkestan into an esstern and western portion. Conjecture even went so far as to assign to its highest points an elevation of 19,000 feet. It was described as dividing Turkestan (q.v.) into two parts, and being connected with the Thian-shan range and others farther north, as well as with the Hindu Kush on the south. Recent explorations have shown, however, that no such range exists, but that there is a lofty plateau which in part corresponds to its supposed position.

BOLSE'NA, an Italian t., in the province of Rome, about 20 m. n.n.w. of the town of Viterbo. It is situated on the n. shore of the lake of Bolsena (*lacus Volsiniensis*), on the road from Florence by Siena to Rome. It has now little more than 2000 inhabitants; but in early ages it was a place of great importance, forming one of the twelve Etruscan cities, under the name of Volsinii. When finally subjugated by the Romans (280 B.C.), as many as 2000 statues are said to have been taken from it; but, though this is doubtless an exaggeration, we may gather from it that the Volsinians had achieved a high reputation for wealth and artistic skill. The Romans razed the Etruscan city to the ground, but built another in its place, which, however, is not much celebrated in history, except as the birthplace of Sejanus, the favorite and minister of Tiberius. Pliny records that it was the scene of supernatural occurrences, king Porsenna having here called down fire from heaven to destroy a monster, Volta, that was ravaging the surrounding country. In later ages, according to the traditions of the Roman Catholic church, a doubting Bohemian priest was here convinced of the truth of the doctrine of transubstantiation, by witnessing the flow of blood from the host he was consecrating; and in commemoration of this supernatural occurrence, Urban IV. instituted the festival of the Corpus Domini. Raphael has immortalized the incident. Half a mile from B. are a few traces of the Etruscan city, and many fragments of the Roman one remain. The lake Bolsena is a fine expanse of water about 10 m. long and 8 broad, but its shores are very unhealthy. The Marta river carries its waters into the Mediterranean. It has two islands, Bisentina and Martana, which were favorite autumnal retreats of pope Leo X. Martana is famous as the scene of the exile and murder of the Gothic queen Amalasontha, by her cousin Theodatus.

BOLSWARD' (Lat. *Bolverda*), an old t. in the Netherlands, province of Friesland, lies 15 m. s.w. from Leeuwarden. It is surrounded by a high earthen wall and broad canal The church of St. Martin, in the Gothic style, is the largest and handsomest in Friesland. There are several benevolent institutions, and a grammar-school. The trade is chiefly in butter, cheese, and cattle. Ship-building, tanning leather, making brick and coarse pottery, spinning worsted, carding wool, etc., are the principal industries. Pop. '76, 5181.

BOLTON (-LE-MOO'RS), an important English manufacturing town, in South Lancashire, on the Croal, 11 miles north-west of Manchester. It was celebrated as far back as the time of Henry VIII. for its cotton and its woolen manufactures, introduced by Flemish clothiers in the 14th century. Emigrants from France and the palatinate of the Rhine subsequently introduced new branches of manufacture; and the improvements in cotton-spinning of the middle of the 18th c., rapidly increased the trade of the town. Though Arkwright and Crompton belonged to B., the opposition of the working classes long retarded the adoption, in their native town, of their inventions—the spinning-frame and the mule. B., containing more than 70 cotton mills, with 2½ million of spindles, is now one of the principal seats of the cotton manufacture in Lancashire. Muslins, fine calicoes, quiltings, counterpanes, dimities, etc., are manufactured. There are 40 foundries and iron-works, and numerous dye-works. The lexicographers Ainsworth and Lempriere were masters of B. grammar-school. During the civil war, the parliament garrisoned Bolton. In 1644, it was stormed by the earl of Derby; and after the battle

of Worcester, that unfortunate nobleman was beheaded there. Pop. '71, 92,655. Since 1832 it has returned two members to parliament. B. parish has numerous coal mines. Between B. and Wigan much cannel-coal occurs, and is often made into snuff-boxes, candlesticks, etc.

BOLT-ROPE, in the rigging of a ship, is the rope to which the edges of sails are sewn, to strengthen and prevent them from tearing. It is of three kinds, according to its position—a *leech*-rope up the perpendicular edge of the sail, a *foot*-rope along the bottom edge, and a *head*-rope along the top edge. Some sails, owing to their shape, have no head-rope. All the cordage employed in furling and unfurling the sail is fastened to the bolt-rope.

BOLTS, in ship-building, are usually either of iron or copper; they are employed either for bolting together certain of the timbers, or for fastening any loose body. The B. are of various sizes and shapes, and the heads variously fashioned, according to the services to be rendered. The heads are named "common," "saucer," "collar," "tee," "calking," "conical," etc. The B. vary from half an inch to nearly three inches in diameter, and from a few inches to many feet in length. The longest are driven through the dead-wood and through the knee of the head; others are used for securing the great guns, the stoppers of the cable, etc.; but the greater number penetrate the timbers of the ship. Some of the smaller are secured at the points by riveting, clinching, or forelocking.

BOLUS (Gr. *bolos*, a clod or lump), a soft mass of any kind of medicine, intended to be swallowed at once; a B. differs from a pill in being larger.

BOLZA'NO, BERNHARD; 1781–1848; a Roman Catholic theologian and philosopher. At 24 he took orders and was appointed professor of the philosophy of religion at the philosophical faculty in Prague. In his lectures he endeavored so to present the Roman Catholic theology as to show its complete harmony with reason, but his views met with much opposition. In 1820, he was accused of connection with some students' societies, and was compelled to resign. Several doctrines found in his works were condemned at Rome, and he was suspended from his priestly functions. The remainder of his life he devoted to literary work. He left 25 volumes, on logic, on the philosophy of Roman Catholic dogmas, on mathematics, and on autobiography.

BO'MARSUND. See ALAND ISLANDS.

BOMB, a missile which also receives the names of *bomb-shell* and *shell*. It is a hollow ball, usually of cast iron, fired from a mortar or other large piece of ordnance, and filled with combustibles which work great havoc when the ball bursts by the firing. All such projectiles were formerly fired from mortars only, and there was thus a definite relation between the B. and the mortar; but since the invention of shell-guns, and other modern pieces of artillery, the name *shell* has been generally substituted for that of *bomb*. The 13-inch B., which is the largest size used in ordinary warfare (instances of exceptional magnitude are noticed under MORTAR), weighs about 195 lbs., with a thickness of metal varying from 1¼ to 2 in. at different parts; it bursts with about 8 lbs. of powder. The vent through which it is filled with powder is, after the filling, closed with a plug called a *fuse*, which sets fire to the powder, and at the proper moment bursts the B. into fragments. The 10-inch B., weighing about 90 lbs., is proportionably less in all dimensions than that just described; and so on for those of smaller diameters. It should be understood, however, that the above are conventional quantities prescribed and adopted more than half a century ago. Modern artillerists try experiments on bombs of various degrees of thickness, and various charges and fuses. Some of the results of these experiments, and some of the modern achievements in B. practice in actual warfare, are noticed under MORTAR and SHELL.

BOMBA, a kind of nickname given to Francis II., king of Naples and Sicily, in consequence of his cruel bombardment of Messina, in Sept., 1848, in which the slaughter and the destruction of buildings was immense.

BOMBA'CEÆ. See STERCULIACEÆ.

BOMBARD, among the now disused engines of war, was a piece of ordnance very short, thick, and wide in the bore. It differed from the balista (q.v.) in being worked with gunpowder instead of by mechanical force; and from the mortar, in shooting forth stones instead of iron shells. Some of the bombards used in the 15th c. propelled stones weighing from 200 to 500 lbs. each.

BOMBARDIER is an artilleryman versed in that department of arms which relates especially to bombs and shells, mortars and howitzers, grenades and fuses. He has learned to load shells and grenades, fix fuses, prepare composition for fuses and tubes, etc.; and on the field or at sieges, he fires the mortars. In some foreign armies, the bombardiers form a separate corps; but in the English army, there are some attached to every battery.

BOMBARDIER BEE'TLE, a name common to many species of coleopterous (q.v.) insects of the genera *brachinus* and *aptinus*, of the tribe *carabidæ* (q.v.). They have received this name in consequence of the remarkable power which they possess of discharging, for their own defense, an extremely acrid volatile fluid from the abdomen,

which diffuses around them a pungent odor, and which explodes on coming in contact with the air. The species of the genus *aptinus* have no membranous wings beneath their elytra; those of the genus *brachinus* have. Both are found chiefly under stones. The large and more brilliant species are tropical. Several small species of *brachinus* are natives of England. The most common English species is only about four lines long. When roughly handled, it will make more than a dozen discharges in rapid succession. When the reservoir which contains the liquid is opened by dissection, it effervesces and evaporates instantaneously. It changes blue vegetable colors to red, and then to yellow; produces sharp pain when applied to the tongue; and leaves a yellow spot upon its surface, like that produced by a drop of nitric acid.

BOMBARDMENT is an attack upon a fortress or fortified town by means of shells, red-hot shot, carcasses, rockets, etc., to burn and destroy the buildings, and kill the people. A bombardment is most likely to be successful when the place is destitute of bomb-proof cover; or when the governor is too humane to expose the unoffending inhabitants to this dreadful ordeal; or when the population is strong enough to compel him to yield. A bombardment requires little engineering science; whereas to reduce a place by regular siege requires the aid of engineers to direct the attack against fortifications, guns, and soldiery, leaving the inhabitants and buildings untouched. Military engineers generally regard a B. as a cruel operation; it is especially directed against the civilians and their buildings, as a means of inducing or compelling the governor to surrender the place, and terminate their miseries. In a well-defended place, the soldiers, the ammunition, and the defense-works suffer comparatively little, seeing that the bombardiers aim at pitching their terrible missiles into the heart of the place. In modern times, a B. is mostly adopted as an adjunct to a siege, distracting the governor by an incessant fire of mortars day and night. At Sebastopol, for instance, the mortars fired shells into the center of the city, to weaken the defense of the forts which were cannonaded by the siege-guns. B. is more frequently a naval than a military operation. The stores required for a vigorous B. are immense. Thus, in 1759, Rodney threw 20,000 shells and carcasses into Havre; in 1792, the duke of Saxe-Teschen threw 36,000 shot and shell into Lille in 140 hours; in 1795, Pichegru threw 8000 shells into Mannheim in 16 hours; and in 1807, the English threw 11,000 shot and shell into Copenhagen in 3 days.

BOMBAX. See SILK-COTTON TREE.

BOMBAY, an island of 8 m. by 3, on the w. of Hindustan, having its southern extremity in lat. 18° 57′ n., and long. 72° 52′ e. It consists of two rocky ridges, which embrace a valley so low as to require embankments against the tide. Its productions, of course, are scanty and unimportant. The rain-fall, with an annual mean of 80 inches, gave, in 1831, 99·64, and in 1838, only 50.78. The temperature, ranging between 70° and 100°, averages, during the year, about 80°. The climate, at one time very unhealthy, has latterly been so much improved by drainage and other appliances, that, in favorable seasons, the proportion of deaths is said very little to exceed that of London. In 1509, about a year before the capture of Goa, the Portuguese visited the island; and by 1530, they had made it their own. In 1661, they ceded it to Charles II. of England, as part of the dowry of his bride, the Infanta Catherine. In 1668, his majesty granted it to the East India company, which, in 1685, transferred what was then its principal presidency to B. from Surat. The name of the island, though manifestly a corruption of the native *Mambai*, may yet, with reference to the goodness of the harbor, have owed its specific form to the Portuguese *buon bahia*. The bay towards the main-land, even in its natural state, presents one of the finest havens in India, more particularly as being one of the few on the e. side of the Arabian sea which are accessible during the s.w. monsoon. Anchoring-ground, of about 50 sq.m., available for vessels of any burden, is sheltered on the n. by Trombay and Salsette, and on the w. by B. itself and its two insular appendages—Old Woman's isle and Colaba; and lastly, the open passage at the s., which thus makes an entering wind of the monsoon already mentioned, is narrowed on the e. by the island of Caranja. Art also has done much to aid nature. The island on the n. and w.—all but Trombay, which, in fact, is itself inclosed—are welded into one by three causeways; while at the s. end of this continuous breakwater, the light-house of Colaba, 150 ft. high, indicates to mariners the entrance of the port along a radius of 20 miles.

BOMBAY (Presidency) has become what it is mainly in the present century. During ninety years, it was confined, with now and then a temporary and insignificant exception, to the island and the two rocky islets on the south. Even the adjacent islands, such as Salsette and Caranja, were acquired only in 1775—the very year in which a younger presidency, after absorbing Bengal, Bahar, and Orissa, annexed Benares. With the exception of the detached territory of Sinde, this presidency, reared principally at the expense of Mahratta dominion, physically divides itself into three parts: the two Concans, between the western Ghauts and the Arabian sea; the eastward slope of the western Ghauts; and, to the n. of both these divisions, the alluvial tracts towards the mouths of the Taptee and the Nerbudda. Of these three regions, the first, though in a higher latitude than the second, is by far the hottest—its temperature occasionally reaching 115°. The first two differ widely as to rainfall. In the Concans, the vapors of the s.w. monsoon, intercepted by the mountains, have been known to yield, at three different places in the same year, 106, 130, and 248 in.; while, almost as a neces-

sary consequence, the eastward slope is generally liable to suffer from droughts. Without anticipating details, which will be given under the respective districts, it may be stated that B., including Sinde, contains 188,195 sq.m., of which 63,523 are in native states, with (1872) 25,624,696 inhabitants. The British part of the presidency has an area of 124,443 sq.m., and a pop. of 16,352,623. The revenue is about £10,000,000, and the expenditure about £1,000,000 less. The administration is vested in a governor and three councilors, subject, however, to the control of the governor-general of India. The ecclesiastical establishment consists of a bishop of the church of England, who has under him an archdeacon and many clergymen; and a number of chaplains of the church of Scotland. The schools are of two classes—seminaries under the various missions, and schools managed by a board of education—the latter being by far the more numerous. The majority of the scholars use merely the vernacular tongues. In 1872–73, the entire number of schools and colleges aided by government, or under its inspection, was 4088, with 218,466 pupils. The university of B. was founded in 1857; 203 candidates passed for admission in 1876. In 1871, the B. army consisted of 10,583 European soldiers, with 1312 officers, along with 27,107 native officers and men. During the mutiny of 1857, the local army remained, on the whole, steady and faithful; and it was, in fact, a portion of it which, under sir Hugh Rose, acted, if not actually the first, at least the second part in the suppression of the insurrection. It is to this presidency that the naval force for all the presidencies belongs. To the island of B., as to Great Britain itself, "wooden walls" were from the beginning a necessary of life, more especially on waters proverbial for piracy from time immemorial. Accordingly, from 1670 onwards, the company's navy have done battle for the crown. B. has benefited vastly from the establishment and extension of the Indian railway system. The first railway in Hindustan was opened in B. in 1853. There are now five main railway lines in B., giving direct communication with Ahmedabad, Calcutta, and Madras. A cable telegraph from B. to Aden was laid in 1869. Of late years, the manufacturing industries have been extremely active in Bombay. Many great cotton-mills have been erected; and the presidency, commanding, as it does, the richest cotton-fields in India, has improved to the utmost its natural advantages, by adding English machinery to its cheap labor and ready material. Government has been liberal in supplying money for public works.

BOMBAY (City) occupies the entire breadth of the s. end of the island, bordering at once on the harbor inside, and on Back bay outside. Next to Old Woman's isle, which, along with Colaba, may be regarded as a suburb, is the European town; about a mile to the n. is the much larger Black town; and between them is the esplanade with the barracks and the railway terminus. The pop., which is exceedingly heterogeneous and dense—as many as 31 persons, on an average, inhabiting each house—amounted, in 1872, to 644,405. The Hindus form the largest section; the Parsees number about 50,000; and the rest are Mussulmans, native Christians, Europeans, Indo-Portuguese, Jews, etc. Amid these various classes, the Parsees or Persians, descendants of fire-worshipers driven from their homes by Mohammedan bigotry, rank next to the English, grade for grade, in respectability and influence. The late sir Jamsetjee Jeejeebhoy, in fact, stands forth, to say nothing of fabulous wealth, as the faultless model of a merchant-prince in enterprise and integrity, in munificence and patriotism; and ever since the introduction of the ship-building business in 1735, the Lowji family, assisted chiefly by operatives of the same race, has been at the very head of this, one of the most important interests of the city—not merely the Indian navy, to be noticed more at large under the next subdivision, but likewise several imperial men-of-war, both frigates and line-of-battle ships, having been almost exclusively the work of Parsees. Besides the dock-yard, which covers about 200 acres, at the s.e. of the European town, the objects most worthy of note are the town-hall, the library of the Asiatic society, the mint, cathedral, and custom-house; the post-office, and public works office; the missionary houses, the Elphinstone institution, the Grant medical college, the university, and Sassoon's high school; the Jamsetjee hospital, and the Jamsetjee obstetric hospital. The city also possesses a chamber of commerce, offices of the Agra bank, government savings-bank, B. steam-navigation company, and several insurance companies. Always favorably situated for foreign trade, B. has profited largely by the reopening of the ancient thoroughfare through Egypt, as saving more distance in proportion than any other emporium in the east, and also as being on the direct line between Madras and Calcutta on the one side, and Aden on the other. When the civil war in the United States caused a sudden cessation of the American supplies, cotton began to be exported from B. in vast quantity; and although the reopening of the southern ports soon checked the extraordinary activity of trade, B. was permanently benefited by the stimulus its commerce then received. It now presses Calcutta closely as the commercial capital of India. Its exports in 1875 amounted to £25,294,992; its imports to £16,501,002. The chief articles of export are cotton, shawls, opium, coffee, pepper, ivory, and gums; the chief imports, piece-goods, thread, yarn, metals, wine, beer, tea, and silk. The chief mail line to India is now by Suez, Aden, and B.; and from B., letters are sent to Calcutta, Madras, etc.

BOMBAY ARMY. See EAST INDIA ARMY.

BOMBAY DUCK. See BUMMALOTI.

BOMBAZINE is a plain fabric of cloth, for dresses, in which the distinguishing characteristic is that the warp is silk and the weft worsted. The cloth has thus a bare look. It is rather fine and light in the make, and may be of any color; and is about 24 in. in width. The fabric is now little used. It was extensively made, and chiefly at Norwich, from about 1816.

BOMB LANCE, a sharp-pointed projectile used in whale fishing, charged like a grenade, and shot from a musket, the slow fuse that explodes it being first lighted. Its power is sufficient to stun the whale.

BOMB-PROOF BUILDINGS are military structures of such immense thickness and strength that bomb-shells and cannon-balls cannot penetrate them. Two of the chief kinds will be found noticed under CASEMATE and MAGAZINE.

BOMB-VESSEL. The various kinds of *B.*, *bomb-ketch*, *mortar-vessel*, and *mortar-boat*, may all be conveniently described under MORTAR-VESSEL.

BOM'BYX. See SILK-WORM.

BOM JARDIM (i.e., Good Garden), a t. of Brazil, in the province of Ceara, 20 m. s. by e. from Crato, in a rich and beautiful mountain valley. It is the center of an extensive district, yielding mandioc, sugar, etc. Pop. 6000.

BOMMEL (Dutch, *Zalt-Boemel*), a t. in the Netherlands province of Gelderland, situated on the Waal. The wide streets and houses, with gardens attached, give the town a pleasant appearance. Besides a large trade in farm produce, book-printing, making soap, beer, leather, nails, tinned pans, cigars, weaving silks, and ribbons, etc., are carried on. There is a Reformed, a Roman Catholic church, a synagogue, and grammar-school. The former defenses are now promenades. Pop. 4282. B. is a station on the railway from Utrecht to Bois-le-duc.

BOM'MELERWAARD, an island in Dutch Gelderland, formed by the Waal and Maas. It contains 12 parishes, is 16 m. in length, and its greatest breadth is 6 miles. Pop. 19,056, two thirds of whom are Protestants. The district is extremely fertile, and besides other farm produce, flax and hops are largely grown. The town of Bommel is situated in the island, which contains many thriving villages. Fort St. André defends it on the e., and Fort Loevesteen on the w.

BO'NA, a seaport t. of Algeria, in the province of Constantine, situated on a bay of the Mediterranean, in lat. 36° 54′ n., long. 7° 46′ e., and known among the Arabs by the name of Beled-el-Areb. The town, divided into two parts, upper and lower B., is situated in a beautiful, but unhealthy district, at the foot of a hill near the embouchure of the Sebus; is surrounded by walls flanked with square towers, and further defended by Fort Cigogne, on the top of the hill. Pop. '72, 16,196. Since the occupation of B. by the French in 1832, the town has been much improved, and has now good bazaars, shops, markets, reading-rooms, etc.; manufactures of tapestry, saddlery, and native clothing, and a trade in wool, hides, corn, coral, and wax. A telegraph cable was laid between B. and Marseilles in 1870; and there is regular steam communication with France, Algiers, and Tunis. Among the public buildings, the Catholic church, and the convent of the sisters of mercy, are most remarkable. Near B. are some scanty remains of the once famous city Hippo Regius, the favorite residence of the Numidian kings, and the episcopal see of St. Augustine, who died here in 430. This city was probably connected with the ancient *Aphrodisium* (the present Bona) by a canal, of which the outline may still be seen in a morass. Hippo Regius, in early Christian times, was the central station of commerce and civilization in n. Africa, and was celebrated for its schools, theater, acqueducts, palaces, and temples, afterwards changed into churches and monasteries. It was totally destroyed by the Mohammedans under caliph Osman in 646.

BO'NA, itself a Latin vocable, literally signifying "goods," and often used in pleading, and otherwise technically to designate personal estate, has several applications in the law of England, of which the following are instances: *Bona confiscata* are forfeitures of lands and goods for offenses, and form a branch of the ordinary revenue of the crown. *Bona notabilia* are chattels to the value of 100*s.*, or personal estate of £5 or upwards, excepting in London, where the sum is £10. Where such small estate was in different dioceses or jurisdictions, it was to be proved in the prerogative court of the archbishop of the province; and so late as the year 1847, an act of parliament was passed (10 and 11 Vict. c. 98), by the 4th section of which it is enacted that the law of bona notabilia should be continued unaltered. But now, by the 20 and 21 Vict. c. 77, amended by the 21 and 22 Vict. c. 95, the whole jurisdiction and authority in relation to granting administration is exercised by the new court of probate. *Bona vacantia*, or stray goods, such as wrecks, treasure-trove, waifs, and estrays, contrary to the general rule, which gives such things to the finder—vest in the crown. *Bona waviata* are also given to the crown.—They consist of goods waived or thrown away by a thief in his flight, for fear of being apprehended.

BONA, GIOVANNI, 1609–74; an Italian cardinal, author of *De Principiis Vitæ Christianæ*, and a work on the liturgy which is accepted as authority. He was also a co-worker in the *Acta Sanctorum*.

BO'NA DE'A (the good goddess), a mysterious Roman divinity, who is variously described as the wife, sister, or daughter of Faunus. She was worshiped at Rome from the most ancient times, but only by women, even her name being concealed from men. Her sanctuary was a grotto on Mons Aventinus, which had been consecrated to her by the virgin Claudia; her festival, however (the 1st of May), was not celebrated there, but in the house of the consul, inasmuch as the sacrifices were then offered up for the whole Roman nation. The solemnities were performed generally by aristocratic vestals. At this celebration, no males were allowed to be present; even portraits of men were veiled. The wine consumed was called milk, in order that its name might not be discovered, and the vessel in which it was served *mellarium*. The symbol of the goddess was a serpent, indicating her healing powers, and certain herbs were sold in her temple.

BO'NA FI'DES, a Latin expression literally signifying good faith, enters largely into the consideration of legal questions, particularly matters of agreement, contract, damage, trusts, and other departments of the law; and in all of them it implies the absence of fraud, or unfair dealing or acting. This term, however, does not appear to occupy any formal or technical place in the law of England. It is the foundation of many just and enlightened maxims in the Roman jurisprudence, which in this respect, as in many others, has been followed by the legal system of Scotland. In the law of that country, a person who possesses and enjoys property upon a title which he honestly believes to be good, although it may be bad, is protected against the consequences of this illegal position by his *B. F.*, and he is entitled to retain the fruits or profits which he has reaped or received during his *bona-fide* occupancy. But such *B. F.* ends when the possessor becomes aware of the insufficiency of his title, whether by private knowledge or otherwise. In the Scotch law, again, while *B. F.* gives no support to the parties, or either of them, in a second marriage, the first subsisting, it would, it is thought, have the effect of rendering the children of such second marriage—that is, children born while the *B. F.* continues—*legitimate*. The reason of this is, that legitimacy in Scotland is not the result merely of a lawful marriage, but may be otherwise acquired; and no offense against the laws being intended by one or both of the parties, it is inexpedient to impose bastardy on the issue. The contract itself is null, because, otherwise, a sanction would be given to bigamy. But the contract having been entered into *in bona fide*, the law considers that it ought to attribute to it all the effects of a valid marriage; and such appears to have been the Scotch law from very ancient times. The law of England is not so indulgent, for there, children born under such circumstances would certainly be deemed bastards. See BASTARDS, BASTARDY; and see on the subject of this article generally, CONTRACT, DAMAGE, MARRIAGE, GUARDIAN, EXECUTOR, TRUSTEE.

The interpretation of the term *bona fide traveler* has given no little trouble to the magistrates of Scotland in reference to the famous "Forbes Mackenzie Act" (q.v.).

BONALD, LOUIS GABRIEL AMBROISE, Vicomte de, a celebrated publicist, was b. in 1753 at Monna, near Milhau, in Aveyron. Compelled to emigrate during the French revolution, he joined the emigrant corps, and, when it was dissolved, removed to Heidelberg, where he employed his pen in the composition of politico-philosophic works on behalf of monarchy. His first important work, *Théorie du Pouvoir Politique et Religieux* (3 vols., 1796), was seized by the directory. It prophesied the restoration of the Bourbons. Having returned to France, B. was induced to accept the patronage of the Bonaparte family, and in 1808 was appointed minister of instruction. In 1816—as deputy for his department—he voted with the ultramontane or theocratic party in the *Chambre Introuvable* (q.v.), and was one of the most influential members of the chamber of deputies in abolishing the revolutionary law of divorce, against which he had written in 1806; in opposing all projects of electoral reform, the alienation of forests, the efforts to get rid of the Swiss mercenaries, the freedom of the press, etc. In 1823, he was elevated to the peerage by Louis XVIII. The July revolution brought his public career to a close, as he refused to take the oath of allegiance to the new dynasty. He died at Monna, 1840. His most important writings are: *Législation Primitive* (3 vols., Par. 1802), and *Recherches Philosophiques sur les Premiers Objets des Connaissances Morales* (2 vols., Par. 1818), which have been immensely applauded by his own party. Their non-agreement with the fundamental facts of history has been proved by impartial criticism. His florid and incorrect style is often detrimental to his logic; and even his admirers must admit that his faith in papal infallibility, and his veneration of the Jesuits, were carried beyond all reasonable bounds. A complete edition of his works, in 12 vols., was published under his own supervision (Par. 1817–19).—His son, LOUIS JACQUES MAURICE B., archbishop of Lyons, 1839, made a cardinal in 1842, faithfully adhered to his father's political and religious principles. He died Feb. 24, 1870.

BONAPARTE (pron. in Ital. in four syllables; in Eng., usually in three), FAMILY OF. In the 13th c., and afterwards, several families named B. appear in Italian records—at Florence, San Miniato, Sarzano, and Genoa; and towards the close of the 15th c., a branch of the Genoese B. family settled at Ajaccio, in Corsica, where they occupied a respectable position as patricians, *padri del commune* or *cittadini*, in the middle of the

16th century. In the 18th c., this family was represented by three male descendants, all residing at Ajaccio: the archdeacon, Lucien B.; his brother, Napoleon B.; and their nephew, Charles.—CHARLES BONAPARTE, father of the emperor Napoleon, was born Mar. 29, 1746; studied law at Pisa; and married in 1767—without the consent of his uncles—a beautiful young patrician, named Letizia Ramolino. In 1768, he removed with his family, accompanied by his uncle Napoleon, to Corte, in order to assist gen. Paoli in defending the island against the French invasion. As the French prevailed, and further resistance was useless, Charles B. attached himself to the French interest, and in 1771 was included by Louis XV. in the election of 400 Corsican families to form a nobility. In 1773, through the influence of Marbœuf, governor of Corsica, Charles B. was appointed royal counselor and assessor of the town and province of Ajaccio. In 1777, he was a member of the deputation of Corsican nobles to the court of France. In this capacity he resided for some time in Paris, where he gained for his son Napoleon, through the interest of count Marbœuf, a free admission into the military school at Brienne. In 1779, he returned to Corsica, and in 1785 went to Montpellier, for the benefit of his health, where he died of cancer in the stomach, Feb. 24, 1785. He was a man of prepossessing exterior and amiable character. By his marriage with Letizia, he left eight children: Joseph B., king of Spain; Napoleon (q.v.), emperor of the French; Lucien B., prince of Canino; Maria Anna (afterwards named Elise), princess of Lucca and Piombino, wife of prince Bacciochi; Louis B., king of Holland; Carlotta (afterwards named Marie Pauline), princess Borghese; Annunciata (afterwards named Caroline), wife of Murat, king of Naples; Jerome B., king of Westphalia. These members of the B. family, with the children of Beauharnais (q.v.), adopted by the emperor Napoleon when he married Josephine, are distinguished as the *Napoleonidæ* of modern French history. By a decree of the senate, Nov. 6, 1804, the right of succession to the throne was restricted to Napoleon and his brothers Joseph and Louis, with their offspring. Lucien and Jerome were excluded on account of their unequal marriages. Napoleon intended to give the right of succession also to Lucien, by the additional act of April 22, 1815; but this was never concluded. As Joseph, the eldest brother of the emperor, had no son, the descendants of Louis became nearest heirs to the throne.—MARIA LETIZIA RAMOLINO, mother of Napoleon I., lived to see her family placed on the thrones of Europe, and also witnessed their downfall. She was born at Ajaccio, Aug. 24, 1750. After the death of her husband, she lived for some time in Corsica, and in 1793, when the island came under British rule, removed with her family to Marseilles, where she lived in poverty, mainly supported by the pension given to Corsican refugees. After her son became first consul, she removed to Paris, and when her son was crowned in 1804, received the title madame mère. A brilliant court-household was given to her, which, however, was never pleasing to her modest tastes. Remembering former adversities, and foreboding reverses of the splendid success of her sons, she was prepared for all that followed. After the downfall of Napoleon, Letizia lived with her step-brother, cardinal Fesch, in winter at Rome, and in summer at Albano, and submitted to her change of fortune with remarkable dignity. She died Feb. 2, 1836, leaving a considerable property, the result of saving habits during prosperity.

BONAPARTE, JOSEPH, eldest brother of Napoleon, was b. at Corte, in Corsica, Jan. 7, 1768, and was educated at Autun. On the death of his father, he returned to Corsica, exerted himself to support the younger members of the family, and removed with them to Marseilles in 1793. In 1797 he was elected a member of the council of five hundred, and in the same year was sent as ambassador from the republic to Rome. In 1800, after he had proved his ability in several offices of state, he was chosen by the first consul as plenipotentiary to conclude a treaty of friendship with the United States of North America. He signed the treaty of peace at Luneville, Feb. 9, 1801, and that of Amiens, 1802; and with Cretet and Bernier conducted the negotiations relative to the *concordat*. After the coronation of Napoleon, new honors fell to the share of Joseph B., who was made commander-in-chief of the army of Naples; in 1805, ruler of the Two Sicilies; and in 1806, king of Naples. Though, during his reign, some beneficial changes of government were effected—such as the abolition of feudality, the suppression of convents, the formation of roads, the repression of banditti, the organization of laws, etc.—yet these reforms were not managed judiciously; and the collision that frequently occurred between his own humane endeavors and the reckless promptings of his imperial brother, who looked upon Naples simply as a province of the French empire, exposed only too well to the Neapolitans the weakness and dependence of their new sovereign. But, in truth, he was far too fond of the fine arts to be a vigorous ruler in stormy times; and he is accused of leaving affairs too much in the hands of his minister, the subtle Salicetti. In 1808, Joseph B. was summarily transferred by his brother to the throne of Spain, and Murat took his place as king of Naples. For Joseph, this was no favorable change: he found himself unprepared to cope with the Spanish insurgents, and after the defeat of the French at Vittoria, he returned to his estate at Morfontaine, in France. In 1813, when Napoleon recognized Ferdinand VII. as king of Spain, Joseph B. refused, at first to abdicate, though he had many times before implored his brother to release him from his royal chains; but he soon submitted, as in all other matters, to the emperor's will.

After the battle of Waterloo, he accompanied Napoleon to Rochefort, whence they intended to sail separately for North America. In his last interview with Napoleon,

Joseph generously offered to give up the vessel hired for his own escape, but meanwhile Napoleon had determined to surrender himself into the hands of the English. After a residence of some years at Point Breeze, in New Jersey, United States, where he employed himself in agriculture, and was highly esteemed by his neighbors, Joseph B. came to England in 1832, having previously, on hearing of the July revolution, written a letter to the house of deputies, in which he advocated the claims of his nephew, the late emperor of France, and in 1841 was allowed to return to his wife, who had remained in Italy since 1815. He died in Florence, July 28, 1844. Joseph was the only one of his brothers for whom Napoleon professed to care anything. He was a handsome, intelligent-looking man, distinguished by the elegance of his manners and conversation. His wife, Julie Marie Clary, born Dec. 26, 1777, was the daughter of a wealthy citizen of Marseilles, and the sister-in-law of Bernadotte, king of Sweden. She was a quiet unambitious woman, with no taste for the splendors of royalty, which fell to her share during a few weeks only at Naples, for she never went to Spain. Ill health appears to have prevented her accompanying her husband to America. She died in Florence, April 7, 1845. By her marriage with Joseph B., she had two daughters—1. Zenaide Charlotte Julie, born July 8, 1801, died 1854, who became the wife of Lucien B.'s son, the prince of Canino; 2. Charlotte Napoléone, born Oct. 31, 1802, died Mar. 3, 1839, who married Louis Napoleon, second son of Louis B., king of Holland. Her husband died Mar. 17, 1831.

Bonaparte, Lucien, prince of Canino, and brother of Napoleon, was born at Ajaccio in 1775, and received his education in the college of Autun, the military school at Brienne, and the seminary at Aix. Rising gradually from one office to another, he was elected deputy for the department Liamone, and, in the council of five hundred, spoke against the squandering of state-property, and formed a party favorable to the views of his brother Napoleon. Shortly before the 18th Brumaire, he was elected president of the council of five hundred, and was the hero of that day. During the ferment which followed Napoleon's entrance, Lucien left his seat, mounted his horse, and riding through the ranks of the assembled troops, called upon them to rescue their general from assassins. Afterwards appointed minister of the interior, he was active in the encouragement of education, art, and science, and organized the prefectures. As ambassador to Madrid, 1800, he contrived to gain the confidence of king Charles IV. and his favorite Godoy, thus putting aside the British influence which had until then been exercised at the court of Spain. It is said that for his services in the treaty of peace concluded between Spain and Portugal, Sept. 29, 1801, he received 5,000,000 francs.

His constant opposition to Napoleon's progress towards monarchy involved Lucien in several misunderstandings with his brother; and their quarrel was brought to an issue by Lucien's second marriage against the views of Napoleon. On condition that he would divorce his wife, the crowns of Italy and Spain were offered to Lucien; but he refused them, and preferred living in retirement at his estate of Canino, in the province of Viterbo, near the frontiers of Tuscany, where he devoted his time to art and science. Here he enjoyed the friendship of the pope, who created him prince of Canino and Musignano; but having denounced in his private capacity the arrogant and cruel policy of his brother towards the court of Rome, he was "advised" to leave the city in which he was at that period residing. In 1810, he took ship for America, but fell into the hands of the English; was brought to England; and after a debate in parliament, was declared to be a prisoner, but treated with distinction. After his brother's downfall, he returned to Rome.

After the defeat at Waterloo, Lucien B. alone seems to have preserved his presence of mind. He immediately advised his brother to dissolve the chambers, and assume the place of absolute dictator. After the second ascent of the throne by Louis XVIII., Lucien lived for some time in and near Rome. In 1830, he went to England, visited Germany in 1838, and died at Viterbo, June 30, 1840. Lucien B. possessed considerable talents and firmness of character. He was in his early years a keen republican, but the weakness of the directory convinced him that a military consulship was necessary to allay the social anarchy of France. He consequently threw himself eagerly into the designs of his brother, but protested against Napoleon giving way to his desire for a hereditary monarchy. As a writer, he was by no means successful. His long and tedious epic poem, *Charlemagne ou d'Eglise Délivrée*, in 24 cantos, was written and published in London, and was dedicated to the pope, 1814. Another heroic poem, *La Cyrnéide ou la Corse Sauvée*, followed in 1819. The *Mémoires Secrets sur la Vie Privée Politique et Littéraire de Lucien B.* (2 vols., Lond. 1819), of which Alphonse de Beauchamp is supposed to be the author, is an untrustworthy book. Lucien B. was the father of a numerous family. In 1795, he married Christian Boyer, the daughter of a citizen of St. Maximin. After her death, he married, in 1803, the widow of a stockbroker, Madame Jouberthon, who was his survivor. By his first marriage, he had two daughters—Charlotte, born 1796, died 1865, who married prince Gabrielli of Rome; and Christine, born 1798, died 1847, who married first a Swedish count named Posse, and then lord Dudley-Stuart. By his second marriage, Lucien had nine children: the eldest daughter, Letizia B., born 1804, died 1871; married, in 1824, Mr. (afterwards sir) T. Wyse, an Irish gentleman; but a separation took place in a few years.—The second daughter, Jeanne B., distinguished by her beauty and taste for poetry, was born in

1806, and died soon after her marriage with the marchese Honorati.—The third daughter, Alexandrine Marie B., born in 1818, married, in 1836, count Vincenzo Valentini de Canino, and gave birth to two sons and one daughter.—Constanze, the youngest daughter of Lucien B., was born in 1823.—Charles Lucien Jules Laurent B. (eldest son of Lucien B.), prince of Canino and Musignano, was born at Paris in 1803. He never exhibited any inclination for political life, preferring the more quiet and wholesome pursuits of literature and science. He acquired a considerable reputation as a naturalist, and especially as a writer on ornithology. He died 29th July, 1857. He was a member of the principal academies of Europe and America. His chief publications are a continuation of Wilson's *Ornithology of America*, and the *Iconografia della Fauna Italica*.—The second son, Paul Marie B., born in 1806, took a part in the Greek war of liberation, and died by the accidental discharge of a pistol, 1827.—The third son, Louis Lucien B., born Jan. 4, 1813, has distinguished himself by his studies in chemistry, mineralogy, and languages.—Pierre Napoleon B., the fourth son, born Sept. 12, 1815, passed through many changes of fortune in America, Italy, and Belgium, returning to France after the catastrophe of 1848. In 1871, he shot a journalist, Victor Noir, for which he was tried the same year at Tours, and acquitted of the charge of murder, but condemned to pay £1000 to Victor Noir's relatives.—The youngest son, Antoine B., born Oct. 31, 1816, fled to America after an affair with the papal troops in 1836, and returned to France in 1848, where he was elected into the national assembly, 1849, but retired from politics in 1851.

Bonaparte, Louis, third brother of Napoleon, was b. Sept. 2, 1778, and was educated in the artillery school at Chalons, where he imbibed anti-republican principles. After rising from one honor to another, he was made king of Holland, 1806; but, in fact, he was never more than a French governor of Holland, subordinate to the will of his brother. Amid all the faults which marked his reign, it must be remembered to his advantage that on several occasions he firmly withstood the demands of France; that he replied to one requisition by saying that, since he had been placed on the throne of Holland, he had "become a Dutchman;" that he nobly refused to accept the tendered crown of Spain; and lastly, that he did not enrich himself during his reign. After the restoration of the house of Orange, Louis considered himself free from all responsibility, and returned to Paris, Jan. 1, 1814, where he was coldly received by the emperor. After living for some years in Rome—where he separated from his wife—he removed in 1826 to Florence, where he lived in retirement. On the escape of his son, Louis Napoleon, from the prison of Ham, the ex-king of Holland was removed as an invalid to Livorno, where he died July 15, 1846. Louis B. was the writer of several works: *Marie, ou les Hollandaises*, 1814, a novel, giving some sketches of Dutch manners; *Documents Historiques, etc., sur le Gouvernement de la Hollande* (3 vols., Lond. 1821); *Histoire du Parlement Anglais*, 1820; and a critique on M. de Norvins's *History of Napoleon*. Louis B. was married in 1802 to Hortense Beauharnais, daughter of gen. Beauharnais (q.v.) by his wife Josephine, afterwards empress of the French. As this marriage was wholly a matter of submission to his brother's will, and put aside a former engagement, it naturally ended in unhappiness and separation

The amiable and accomplished Hortense Eugenie Beauharnais, the adopted daughter of Napoleon, queen of Holland, and countess St. Leu, was born in Paris, April 10, 1783. After the execution of her father, she lived for some time in humble circumstances, until Napoleon's marriage with Josephine. In obedience to the plans of her step-father, she rejected her intended husband, gen. Desaix, and married Louis B. in 1802. In 1814 she was the only one of all the *Napoleonida* who remained in Paris. After the hundred days, she visited Augsburg and Italy, and then fixed her residence at Arenenberg, a mansion in the canton Thurgau, where she lived in retirement, sometimes spending a winter in Italy. In 1831, when her two sons had implicated themselves in the Italian insurrection, the countess traveled in search of them through many dangers, and found the elder deceased, and the younger, the late emperor of the French, ill at a place near Ancona. Returning with her son to Paris, she was pleasantly received by Louis Philippe and by Casimir Périer, but was obliged, in the course of a few weeks, to remove with her son to England. After some stay there, she removed to her country-seat, Arenenberg, where she died, after severe suffering, Oct. 3, 1837, and was buried near the remains of her mother, Josephine, at Ruel, near Paris. She was the authoress of *La Reine Hortense en Italie, en France, et en Angleterre, pendant l'année* 1831, and wrote several excellent songs. She likewise composed some deservedly popular airs; among others the well-known *Partant pour la Syrie*, which the late emperor of the French, with a delicate union of political tact and filial pride, made the national air of France. Of her three sons, the eldest, Napoleon Louis Charles, born 1803, died in childhood, Mar. 5, 1807. The second, Louis Napoleon, born 1804, crown-prince of Holland, married his cousin Charlotte, daughter of Joseph B., and died at Forli, Mar. 17, 1831. The third, Charles Louis Napoleon, became emperor of the French. See Louis Napoleon.

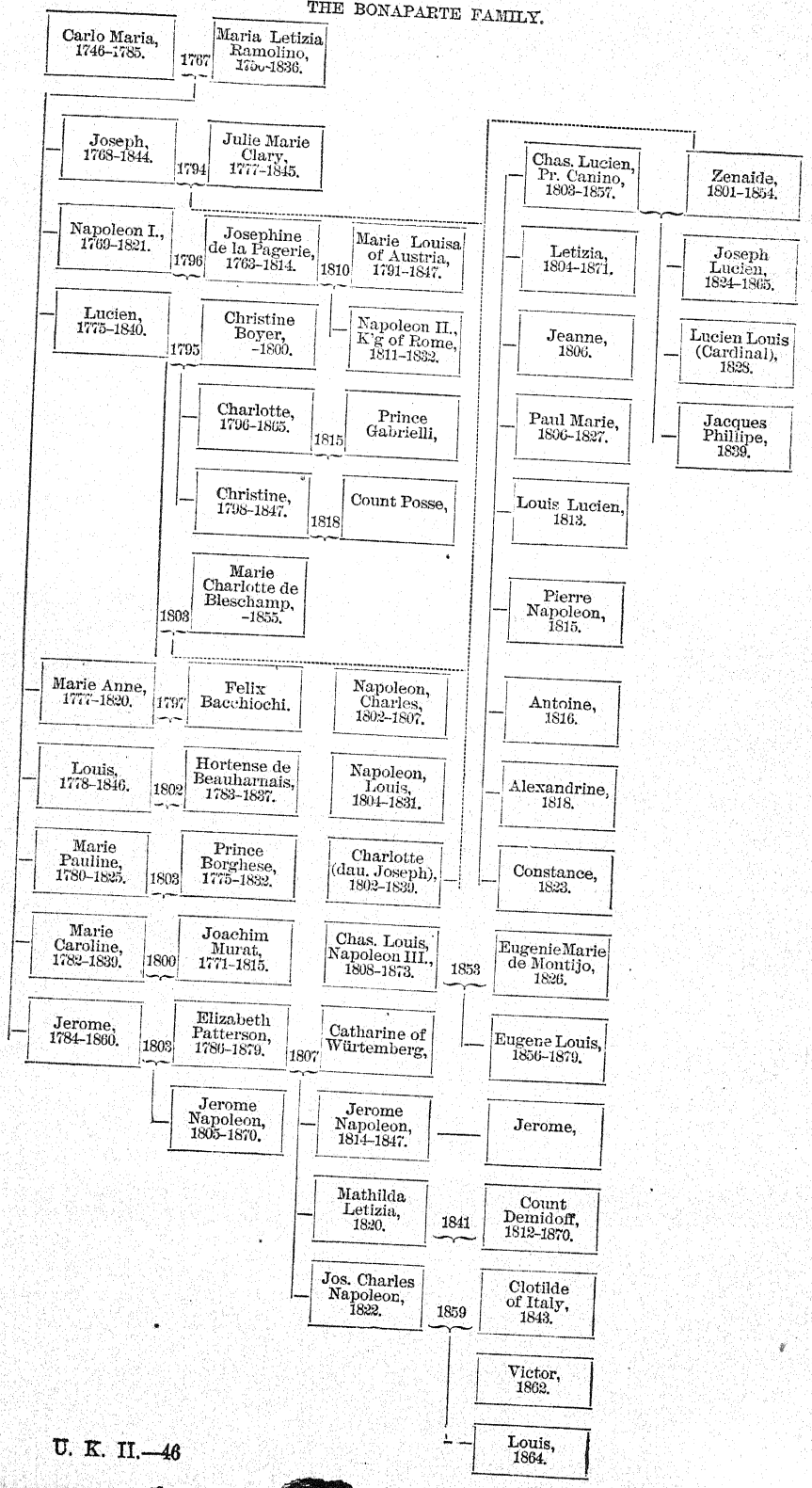
Bonaparte, Jerome, youngest brother of Napoleon, was b. at Ajaccio, Nov. 15, 1784. After receiving his education in the college at Juilly, he served as naval lieut. in the expedition to Hayti. When war broke out between France and England in 1803, Jerome was cruising off the West Indies, but he was soon compelled to take refuge in

the port of New York. While in America, he married Elizabeth Patterson, daughter of a merchant in Baltimore, Dec. 27, 1803. Subsequently, he was employed by Napoleon in the liberation of Genoese prisoners who had been captured by the dey of Algiers. In the war with Prussia, he commanded, in concert with gen. Vandamme, the tenth corps in Silesia, and on the 1st Dec., 1807, was made king of Westphalia. He was recognized with great pomp at Cassel, where he lived in splendor, caring very little for government, not even taking the pains to acquire the vernacular language of the country. After the war with Austria, the finances of Westphalia, through mismanagement, plunder, and extravagance, as well as war-expenditure, were found in an exhausted condition. The battle of Leipsic brought the reign of Jerome to a close. After the peace of 1814, he left France, and resided in Switzerland, at Grätz, and in the beginning of 1815, at Trieste. He was made a peer when Napoleon returned from Elba, and fought by the side of the emperor at Ligny and at Waterloo. After his brother's abdication, he left Paris, June 27, and visited Switzerland and Austria, but ultimately settled in Florence. His request to be allowed to return to France was rejected in 1847, by the chamber of peers, but was afterwards granted, and at the outbreak of the Feb. revolution, Jerome B. was in Paris, where he was appointed governor of the Invalides in 1848, and in 1850 was made a French marshal. He died in 1860.

His marriage with Elizabeth Patterson having been declared null by Napoleon, Jerome was forced, after he had gained the Westphalian crown, to marry Sophia Dorothea, daughter of king Frederick I. of Würtemberg. After the battle of Waterloo, her father wished to annul the marriage; but the wife of Jerome declared her resolution to share through life the fortunes of her husband. Jerome B. left in America one son by his first marriage, and had three children by his second wife.—JEROME B., the elder son, born Aug. 24, 1814, died May 12, 1847; MATHILDE LETITIA WILHELMINE B., princess of Montfort, born at Trieste, May 27, 1820, married the Russian count Anatol Demidov, and lived with her husband at the court of Louis Napoleon during his presidency. The younger son, NAPOLEON JOSEPH CHARLES PAUL B., born at Trieste, Sept. 9, 1822, passed his youth in Italy; entered the military service of Würtemberg, 1837; afterwards traveled in several countries of Europe; and was banished from France, 1845, on account of his intercourse with the republican party. He returned to Paris with his father, 1847, and after February, 1848, was elected into the legislative national assembly. He commanded an infantry division of reserve at the battles of Alma and Inkermann the following year. In 1859, he married the princess Clotilde, by whom he has two sons and a daughter. When war with Prussia was declared in 1870, Prince N. proceeded on a diplomatic mission to his father-in-law, at Florence, but failed to obtain the co-operation of Italy with his cousin. After the fall of the empire he took up his residence in England, but returned to France in 1872.

BONAPARTE (*ante*), also NAPOLEON, *ante*. The following table shows the relationships of this family, whose members have been so prominent in modern Europe:

THE BONAPARTE FAMILY.



Prince Lucien Bonaparte names the following who, 1880, are in order of succession 1. Cardinal Bonaparte. 2. Napoleon Charles, brother of the cardinal. 3. Louis Lucien 4. Pierre Napoleon. 5. Jerome, grandson of Jerome, the youngest brother of Napoleon.

BONA'SIA, a genus of gallinaceous birds of the grouse (q.v.) family or *tetraonidæ,* perhaps more properly only a sub-genus of grouse (*tetrao*), distinguished by having the toes and the lower part of the tarsus (or shank) destitute of feathers; also by the elongated feathers of the upper part of the head. To this genus belongs the hazel grouse of the continent of Europe (*tetrao bonasia* of Linnæus), a species which, although not found in Britain, is very widely distributed from Siberia to Africa, and throughout that continent. In size, it scarcely exceeds the common partridge, is prettily mottled with gray and reddish-brown, and has a black band near the extremity of the lateral tail-feathers. It loves the deepest solitudes of forests. The eggs are 12 to 18 in number. The flesh of this bird is highly prized, and German etiquette has long assigned it a place above all other dishes at the tables of princes, as the only dish which may be served twice in succession.—Another species of B. is the ruffled grouse of America (*B. umbellus,* or *tetrao umbellus*), known also in some parts of the United States by the names of pheasant and partridge. It is nearly equal in size to the black-cock of Europe. Besides having the feathers of the upper part of the head elongated, the male has a large shoulder-tuft on each side. This bird is found in almost all parts of North America, from the gulf of Mexico to Hudson's bay, and from the Atlantic to the Pacific ocean. It is polygamous, and in spring the males make a noise called *drumming,* by rapid clapping of their wings, to attract the attention of the other sex, whilst they also strut with erected ruff and tail, and with wings depressed, after the manner of the turkey-cock. At this time they have fierce battles with one another, and advantage is sometimes taken of their jealous pugnacity to attract them within shot, by an imitation of their drumming, accomplished by means of a bladder and a stick. The nest is formed on the ground in the woods, often under a bush, and 5 to 12 eggs are laid in it. The flesh of the ruffled grouse is much esteemed, and the markets of the American cities and towns are well supplied with it in the winter months.—It seems probable that both these species of B. might be easily introduced into Britain, and they would be very desirable additions to the game of woods and plantations.

BONAS'US, or BONAS'SUS. See BISON.

BONAVENTU'RA, SAINT, one of the most eminent Catholic theologians, whose real name was John of Fidanza, was b. in 1221 at Bagnorea, in Tuscany. In 1248, he became a Franciscan monk; in 1253, a theological teacher at Paris, where he had studied; and in 1256, general of his order, which he governed strictly, but affectionately. The influence of his character now began to penetrate the church; and it was mainly through his eloquent persuasion that the differences which had sprung up among the cardinals on the death of Clement IV. in 1268 were reconciled, and all induced to unite in electing to the papal dignity Tedaldus Visconti (Gregory X.). The new pope created B. bishop of Albano, and cardinal in 1273, when he accompanied Gregory to the council of Lyon, where he died, July 15, 1274, from sheer ascetic exhaustion. He was honored with a splendid funeral, which was attended by the pope, the king, and all the cardinals.

On account of his unspotted character from earliest youth, as well as the miracles ascribed to him, he enjoyed, even during his life-time, especial veneration. Dante, who wrote shortly after, places him among the saints of his Paradiso; in 1482, he was formally canonized by Sixtus IV.; and in 1587, was ranked by Sixtus V. as the sixth of the great doctors of the church. The religious fervor of his style procured for him the title of *doctor seraphicus,* and his own order are as proud of him as the Dominicans are of Thomas Aquinas. A great part of his writings is devoted to the praise of his order, and to the defense of Mariolatry, celibacy, transubstantiation, communion in one kind, and other doctrines and practices of the middle ages, which he attempts to deal with in a philosophical manner. His most important works, the *Breviloquium* and *Centiloquium,* are properly text-books on dogmatics. Unfortunately, his efforts to philosophize the church creed, and that deep mysticism in which his spirit reveled, make him often obscure and unintelligible even in his most popular treatises. With B. theology is the goal of all art and science; and in his *Itinerarium Mentis in Deum,* as also in his *Reductio Artium in Theologiam,* he represents union with God, to which the soul attains through six stages, as the highest good. He did more than any other of the early theologians to give a scientific form to the mystical theology. His *Biblia pauperum,* or "poor man's Bible," is a mystico-allegoric explanation of the plain contents of the sacred books for the benefit of the laity. In warmth of religious feeling, however, and in the practical tendency of his ethics, he far excels the hair-splitting scholastics. In his commentary on the *Sententiæ* of Peter the Lombard, he acutely argued against the eternity of the world, and also advanced some original proofs of the immortality of the soul. The most complete edition of his works appeared at Rome (8 vols. 1588–96).

BONAVENTURE, a co. in the province of Quebec, Canada, on the bay of Chaleurs, separated from New Brunswick by the Mistouche and Ristigouche rivers; 3290 sq.m.; pop. '71, 15,923. Capital, New Carlisle.

BONA VISTA, a bay and cape on the e. coast of Newfoundland, in lat. 48° 42′ n., and long. 53° 8′ west.

BONCHAMP, CHARLES MELCHIOR ARTHUR, Marquis de, one of the bravest leaders of the Vendean party in the civil war consequent upon the French revolution, was born at Jouverdeil, in the old province of Anjou, May 10, 1760; took part, like many young French officers, in the American war of liberation; and when he returned to France, was made captain. Of strong royalist principles, he looked with disfavor on the revolution. After living for some 18 months in solitude, he allowed himself to be chosen leader of the Anjou insurgents. The army of La Vendée would have been more formidable if B.'s tactics had been adopted, but this was not done until it was too late. In the sanguinary encounter at Chollet, Oct. 17, 1793, B. received a fatal shot in the breast, and when his followers vowed to avenge his death on 5000 republican prisoners, the dying hero exclaimed: "Spare your prisoners. I command it." This last command was obeyed.

BOND, in masonry, is the connection established among the stones or bricks in a wall, by disposing them so as to overlap one another. See BRICKLAYING.

BOND, in law, is an instrument on stamped paper, by which the party granting it becomes bound to pay a sum of money, or perform any act or duty, according to the terms of agreement. In England, a B. is said to be an instrument under seal, whereby one person becomes bound to another for the payment of a sum of money, or for the performance of any other act or thing. The person who is thus bound is called the obligor, and he to whom the B. is given, the obligee; and this obligation may be either by or to one or several persons. The B. may be unconditional simply for the payment of money, or it may be accompanied with a condition, the performance of which is secured by a penalty; but in any event, the debt created by a B. is of the high nature of a *specialty debt* (q. v.).

The requisites of a good B. are as follow: 1. The B. must have an obligor and obligee. In regard to such parties, it is to be observed that in general no person who is under any legal disability to contract, can become an obligor, though it is otherwise of an obligee. Thus, B. by a married woman neither binds herself nor her husband, but is absolutely void. This is a rule, however, which is liable to some qualifications. See HUSBAND AND WIFE. Nor can an infant bind himself, unless the B. be for necessaries. But although a married woman is incapable of executing a B., yet one given to her is valid, and the interest in it will vest in her husband, without whose concurrence in its acceptance indeed the B. will lose its force. In the same way, a B. may be given to an infant, a lunatic, or an alien. 2. The next requisite of a B. is, that it must state the precise sum in which the obligor is bound; any omission in this respect will invalidate the instrument. If, however, the sum be merely erroneously stated, the courts will make the necessary correction, and construe the B. so as to give effect to the intention of the parties. In practice, the sum stated is generally double the sum intended to be secured —the excess being meant to cover the interest and any costs. 3. A B. must be so expressed as to create a clear legal obligation. But for this purpose no particular form of words is necessary; any mode of expression by which the intention appears will suffice. A B., again, may be in the first or third person, only it must be expressed in the English language, and not in Latin or French. 4. The B. must be duly executed. Such execution, in general, is the same as that of deeds, the sealing being the essential solemnity; and although it is usual for the obligor to sign the B., his signature is not necessary to its validity. Then the B. must be delivered, but it need not be dated; a B. has even been held good, though it bear a false or impossible date, on the principle that deeds take effect from, and have relation to, the time of their delivery, and not in reference to their date. Such, in general, is the form and structure of an English B., and it is used in an infinite variety of contracts.

In Scotland, the B.—personal B., as it is called—differs in several points of form from the English instrument. Its general structure is different, and it is executed in a different manner, with much solemnity and particularity, but without sealing; it does not bear to be for double the sum due, or any sum other than the correct one, which it states with precision, with a liquidate penalty, which is usually one fifth of the principal sum; and it must have a *true* date and be very specific in all its details. As in English practice, there are in Scotland two kinds of these instruments: first, bonds for money simply; and secondly, bonds for the performance and accomplishment of some act, or, as they are called in Scotch practice, bonds *ad facta prestanda*.

A mortgage over land or other real estate is also in Scotland in the form of a B., by which name, indeed, the mortgage is technically described. Thus, there is the *heritable B.*, and the *B. and disposition in security*, the latter being the more modern form. By these mortgage bonds, the borrower not only becomes personally bound in the repayment of the loan, but "in further security and more sure payment" he also conveys to the lender the land, or other real property, itself, on which the sum is to be made a charge, with, in a certain event and under certain conditions, a power of sale, by means of which the creditor, on the debtor's default, may recover his money. There are, in England, bonds by which expectant heirs may operate on their reversions, and these are called *post obit bonds*.

According to the law of both countries, certain bonds are void; such as a B. conditioned either to do something which the law considers wrong in itself, or which is legally prohibited, or to omit doing something which is a duty, or to encourage the performance of anything which is in the nature of a crime or offense against the law. In like manner, bonds to procure marriage, called marriage brocage bonds, or to restrain marriage, or for immoral considerations, or in restraint of trade, are void. A B., however, may be valid in part, or void in part, if such parts are separable. See MORTGAGE, BROCAGE BONDS TO PROCURE MARRIAGE, SPECIALTY DEBT.

BOND, in law (*ante*), is simple or conditional, the latter being generally used. It must be in writing, and signed, and should be sealed. The condition is the vital part, limiting and determining the amount to be paid or the thing to be done, and no person can take the benefit of a B. except the parties named therein, save in the case of a B. given by an officer for the performance of duty. If a B. runs to several persons jointly, all must join in suit for breach, although the conditions may not at all affect some of them. Recovery against a surety on a B. is not limited to the penalty, but may go beyond as far as necessary to include interest from the time of default. A B. dormant for 20 years cannot afterwards be recovered, the presumption being that it has been satisfied. If the maker of a B. binds himself without adding "heirs," the heirs cannot be held, but the executors and administrators are liable.

BOND, a co. in s.w. Illinois, intersected by the St. Louis, Vandalia, and Terre Haute railroad; 400 sq.m.; pop. '70, 13,552, in '80, 14,873. It is a prairie and woodland region, with fertile soil, producing cereals, and having coal mines. Co. seat, Greenville.

BOND, GEORGE PHILLIPS, 1825–65; son of William Cranch, and his assistant in the observatory, succeeding to full charge on his father's death. He published a *Treatise on the Construction of the Rings of Saturn*, and *Elements of the Orbits of Hyperion and the Satellite of Neptune*. That satellite and the 8th of Saturn were discovered by his father and himself. For a work on Donati's comet the royal astronomical society sent him a gold medal.

BOND, THOMAS EMERSON, D.D., 1782–1856; a physician, editor, and minister, b. in Baltimore; professor in Maryland university, and local preacher of the Methodist church. In 1830, he was editor of the *Itinerant*, and in later years for a long time of the *Christian Advocate and Journal*, the leading newspaper of that church. Among his works are *Appeal to the Methodists*, and *Narrative and Defense*.

BOND, WILLIAM CRANCH, 1789–1859; b. Maine; an eminent astronomer. He was self-educated, and had a private observatory at Dorchester, where his discoveries attracted much attention. In 1838, he was chosen by the U. S. government to make observations for the use of the Wilkes's exploring expedition. In 1839, he supervised the construction of the observatory at Harvard, and became its director. He was the inventor of a method of measuring time to a very small fraction of a second, and among the first to employ photography in stellar observations. He was a member of the academy of arts and sciences, and of the philosophical and royal astronomical societies of London.

BOND'AGER, the term applied in Scotland to a rural laborer who rents a cottage from a farmer under an obligation to work for him at current wages at certain seasons. There are male and female bondagers, but the arrangement in each case is the same. The origin of the bondager system is the want of a sufficient rural population for the field-work of the neighborhood. To induce the settlement of laborers, a landlord gives a certain number of cottages along with each farm, and the tenant-farmer has the privilege of letting these, with a view to securing casual assistants, such as at turnip-hoeing and harvest. When wanted, they are obliged to turn out though it may be at a sacrifice in point of wages or feeling. Such are bondagers, a class of cottagers over whom the landlord has no direct control; and as the farmer for the most part looks alone to their physical capacity, their moral and social condition is not generally creditable.

BOND CRED'ITOR, in England, is the name sometimes given to a creditor whose debt is secured by a bond, and therefore privileged as a specialty. See preceding article.

BONDED WAREHOUSE. See WAREHOUSING SYSTEM.

BÖNDER, in Norway and Sweden, the landowners or farmers. Under the ancient kings of Norway they were a powerful class, and often compelled important concessions from their rulers, or deposed them. They would nearly correspond to burgesses and barons in England.

BONDI, CLEMENTE, a modern Italian poet, b. in 1742 at Mizzano, in Parma. He was educated by the Jesuits; and when still very young, appointed to deliver lectures in rhetoric, in the royal convent at Parma. Here he produced his first work, *Giornata Villereccia* (Parma, 1773), which is a not very lively picture of the rural pleasures of the brotherhood. Having celebrated in verse the abolition of the Jesuit order, he was subjected to a priestly persecution, and compelled to conceal himself in the mountains

of the Tyrol; but ultimately he found a patron in the Austrian Archduke Ferdinand. He fixed his residence in Vienna, where he died in 1821. His poems are lyrical, descriptive, satirical, and elegiac. They please cultivated men, but more especially women of delicate sensibilities, by the light-flowing elegance of their versification, and the rare purity of their style. Among his larger works may be mentioned, *La Conversazione*, *La Felicità*, and *Il Governo Pacifico*. Italians consider B.'s translation of the *Æneid* to possess remarkable excellence. His entire works were published at Vienna in 1808.

BONDOU', or BONDU, a country of Senegambia, w. Africa, lying between lat. 14° to 15° n., and long. 11° to 13° west. The population is estimated at 1,500,000, who are principally engaged in the cultivation of the soil, which is fertile, producing cotton, indigo, millet, maize, tobacco, etc. The weaving of cotton-cloth, which, besides being made up into articles of dress, is used as currency, also forms part of the industry of the people. The surface of B. is level, with elevations in the north and central parts; the climate generally healthy, and vegetation luxuriant alike in field and forest. Iron is said to be plentiful, though not much worked, and gold is obtained in small quantity. Wild animals are numerous; and the principal river on the eastern border of the country, the Falemé, abounds with crocodiles. The inhabitants of B. profess Mohammedanism, but they trust greatly in sorcerers. The sovereign is absolute. B. exports cattle, corn, and gums; and has a transit trade in slaves, gold-dust, iron, salt, and butter. The capital, Bulibani, is situated in a plain bounded by rocky hills and forests on the left bank of the Falemé. Its streets are unpaved and dirty, and its buildings mean and miserable; mud-walls surround it, and in its center is the extensive but rude palace of the sovereign. Pop. about 2200, composed in great part of slaves, from the sale of which the ruler derives a considerable revenue.

BONE is the hard material of the skeletons or frameworks of mammalian animals, reptiles, and birds. In its earliest stages, it is termed temporary cartilage (q.v.), and consists of cells massed together, except in the flat bones, as those of the skull and shoulder-blade, of which the primary foundations are to a great extent of fibrous tissue. Points or centers of ossification form, the cells alter their form and arrangement, and a deposit of earthy materials, phosphate and carbonate of lime, takes place, rendering the former flexible substance rigid. By soaking a B. in a dilute mineral acid, we can dissolve these earthy matters, and render it again flexible; on the other hand, if we expose it to intense heat, the animal matter (gelatine) is got rid of, and though the bone retains at first its form, the slightest touch will cause its now unsupported earthy matter to crumble away. We see, in the ill-nourished children of large towns, too many examples of how necessary a proper relation of these two elements of B. to each other is; in the disease called rickets, the earthy matter is deficient, and the too flexible leg-bones bend under the weight of the trunk. In the aged person, again, the B. substance becomes more densely packed with earthy matter, and becomes brittle, rendering them peculiarly liable to fractures.

The bones of the skeleton are classified according to their shapes—viz., as long bones, e.g., the thigh-bone and arm-bone; flat bones, as the shoulder-blade and skull-bones; short and irregular bones, as those of the wrist or vertebræ. The substance of bones is arranged differently in different parts—either hard and close, which is called the condensed substance, or loose and reticulated, called the cancellated structure. *Long bones* have a shaft of hard substance terminating at each end in soft or cancellated structure; in the latter situations, the B. is more expanded and rounded off to enter into the formation of a joint. *Irregular bones* consist of a shell of condensed tissue, inclosing a mass of cancellated structure, and are smoothed off into surfaces adapted to those of the adjoining bones. *Flat bones* consist of two layers of hard tissue, with an intermediate cancellated structure. Anatomists also talk of *mixed* bones, those which are both long and flat, as the ribs, the breast-bone, and the lower jaw.

The shaft of a long B. is hollow, and filled with an oily substance, the marrow (q.v.); the space in which the marrow lies is called the medullary canal. This fatty substance is also found in the cancellated structure of short and mixed, and in the diploë of flat bones, and even in the condensed tissue. Bones are covered externally by periosteum (q.v.), and on the surfaces of the cavities within by a fine membrane called internal periosteum or medullary membrane. B. is largely supplied with blood-vessels, which are continued into it from those of the periosteum; the largest are those which enter the cancellated ends of the long bones. The medullary membrane receives a special artery for the supply of the compact tissue next the canal. This vessel enters the bone generally rather above its middle, and divides into two branches, one of which runs up, the other downwards, both dividing into numerous branches, anastomosing with the vessels we have alluded to as entering the cancellated tissue. After the arteries enter the compact tissue of bones, they run in small capillary canals, invisible to the naked eye, which permeate the bone, and anastomose, leaving oblong loops or meshes. The veins of B. are also contained in these canals, but they are larger than the arteries, and possess at irregular intervals, where branches meet, dilatations or reservoirs for the blood.

These canals, named Haversian, after their discoverer, Clopton Havers, an old English anatomist, vary in diameter from $\frac{1}{250}$ to $\frac{1}{200}$ of an in. They take a longitudinal direction, and if a transverse section is examined under the microscope, it appears

pierced with holes, which are the Haversian canals cut across. Each canal is surrounded by its own layers of condensed structure, forming in the aggregate a hollow rod or pin, called the Haversian system, running through the plates of which the B. is composed, and securing their cohesion. In addition to these, there are to be seen a number of minute spaces or *lacunæ*, generally oval in man; from these pass numerous pores or *canaliculi*, which are directed to the nearest vessels: those in the periosteal, or outer lamella, pass into the B. from orifices on its surface, and the lacunæ face outwards. The pores of the internal layer open on the medullary canal, and its lacunæ face towards it, and the lacunæ in the layers around each Haversian canal face towards, and their pores open into it.

Nerves may be seen entering B., and the acute pain felt in some of its diseased conditions prove their existence, but they have not yet been actually demonstrated in the osseous tissue; neither have *absorbents*, though we suppose from analogy that bones are supplied with them.

The several bones composing the animal frame will be treated of under the head Skeleton. Any important peculiarities in the bones of different classes of animals, under the heads of these classes.

Chemical Composition of Bone.—The principal chemical ingredients present in B. are gelatine and phosphate of lime; and the following table represents the composition in 100 parts of B. of average quality:

	Human bones.	Ox bones.
Gelatine	33.30	33.30
Phosphate of lime	53.04	57.35
Carbonate of lime	11.30	3.85
Phosphate of magnesia	1.16	2.05
Soda and chloride of sodium (common salt)	1.20	3.45
	100.00	100.00

When a B. is digested in dilute hydrochloric acid at a summer heat, the earthy matters are gradually dissolved out, leaving the gelatine of the size and shape of the original B., but now soft, somewhat transparent, flexible, and even elastic. If this soft gelatinous residue of B. be boiled with water, it dissolves in great part therein, and yields a solution which *sets* or gelatinizes on cooling. A more common way of extracting the gelatine from B. is to heat the bones covered with water in a digester to a temperature of 270° to 280° F., when much of the gelatine dissolves out, and leaves the earthy salts with the remainder of the gelatine. Besides the marrow (q.v.), a little fat is generally found permeating the entire structure of the B., which can be extracted by throwing the bones into hot water, when the grease or fat exudes and floats to the surface. In some of the larger bones of man and other mammalia, there is a central cavity containing a considerable amount of fatty matter, popularly known as *marrow*. These cavities are not found in the bones of the young animal, but gradually form as the animal approaches maturity. In the sloth, cetacea, seals, and a few other animals, the cavities are not found. Occasionally, as in man, the elephant, giraffe, etc., the bones in the head have cavities filled with air instead of marrow. The uses to which a B. may be put are various. In the cooking of soups, bones form a constant ingredient, and become useful in supplying gelatine, which gives a *body* to the soup it would not otherwise possess. Where the soup is required of great lightness, for an invalid with weak digestive powers, the shavings of stag's horns may be employed, and these yield a *hartshorn jelly* free from oil, and which therefore sits lightly upon the stomach. How far gelatine is of itself nutritious, is a disputed question. See Gelatine and Nutrition. Animals, however, like the dog, which masticate, devour, and digest the entire B., do derive benefit therefrom, in part from the gelatine, and in other part from the earthy substances; and the same remark applies to the use sometimes made of small fish, where, after being thoroughly browned, they are entirely eaten. In times of scarcity in Norway and Sweden, the poorer people even eat the bones of mackerel and other fish.

B. is largely used in making the handles of small brushes, the more common table-knives and forks, and penknives, and in the manufacture of the cheaper sorts of combs (q.v.). Our forefathers, before the metals were known, fashioned fish-hooks out of B., and used the spines in the tail and back-fin of certain fishes for pointing arrows. These uses of B., coupled with the employment of the serrated teeth of sharks as a war-weapon, are still practiced by many uncivilized tribes. The fatty and other organic matters in B. allow of its being employed as a fuel where coal or wood cannot be obtained, as in the pampas of South America and the steppes of Tartary. In these regions, it is considered that the heat evolved during the combustion of the bones of an ox suffices to cook the flesh.

B. is likewise serviceable in the arts in yielding bone-ash (q.v.), bone-black (q.v.), bone-dust (q.v.), dissolved bones (see Bones, Dissolved), phosphorus (q.v.), and superphosphates; also certain oils and fats (see Dippel's Animal Oil), which are employed in forming lampblack (q.v.), and in the manufacture of soap (q.v.). See also Bones as Manure.

BONE, HENRY, R.A., a celebrated enamel-painter, was b. at Truro, in Cornwall, in 1755. Apprenticed to a china-manufacturer in Bristol, he removed from thence to London in 1779, where he was employed in enamel-painting for lockets, brooches, etc. An enamel-portrait of his wife, exhibited at the royal academy in 1780, first attracted public attention; and he soon obtained a position which rendered it no longer necessary for him to continue his drudgery for the jewelers. In 1800, he was appointed enamel-painter to the prince of Wales, a position which he retained when the prince became king; and he also stood in a similar relationship to George III. and William IV. The royal academy made him an associate in 1801, and a full academician ten years later. Between this time and 1831, when advancing years compelled him to desist from his labors, he produced a large series of works remarkable alike for their beauty and dimensions; in the latter quality they were unapproached by any former or contemporary artist, and the principal of which are "Bacchus and Ariadne," after Titian, which was sold for 2200 guineas, and is now in the national gallery; the "Death of Dido;" "Hope Nursing Love," after Sir Joshua Reynolds; "Venus," etc. He also executed a large number of historical portraits of great merit; and altogether his name is one of the highest, if not the highest in his profession. He died Dec., 1834.

BONE-ASH, or BONE-EARTH, is obtained by the complete combustion of bones in an open furnace, when the oxygen of the air burns away the organic matter or gelatine, and leaves the earthy constituents as a white friable mass, the size of the original bone, but readily reducible to the condition of coarse powder, which is bone-ash. A very large quantity of bone-ash is exported from South America to other countries, especially Britain. The used-up bone-black of the sugar-refiner is also employed as a source of bone-ash, by being heated in a furnace exposed to the air. Bone-ash of good quality contains about 80 per cent of phosphate of lime, and 20 per cent of carbonate of lime, phosphate of magnesia, soda, and chloride of sodium (common salt); but it is occasionally found mixed with sand, especially that procured from South America. Bone-ash is employed to some extent as a source of phosphorus (q.v.), and in the making of cupels (q.v.) for the process of assaying (q.v.); but the most extensive use is in the manufacture of artificial manures, such as dissolved bones (q.v.) and superphosphates.

BONE-BLACK, ANIMAL CHARCOAL, or IVORY-BLACK, is prepared from bones by heating them in close retorts till they undergo the process of destructive distillation, when combustible gases and water, together with the vapors of various salts of ammonia, and oil, are given off, and bone-black is left in the retort. It is generally reduced to coarse grains from about the size of small peas, down to large pinheads, and is extensively used in the arts for decolorizing liquids, such as the syrup of sugar, and solutions of argol (impure cream of tartar), and of the alkaloids, as also in filters (q.v.), for separating chemical impurities from water. The general mode of using the bone-black is to allow the colored liquid to percolate through a layer of the charcoal, when all color is arrested, and the syrup or water runs clear and colorless from under the stratum of charcoal. This power of absorbing coloring matters is also observable in vegetable (peat or wood) charcoal, but not to such an extent as in bone-black. The application of heat to the liquids before filtration greatly facilitates the decolorization, and where the volume of liquid to be operated upon is not great, the most expeditious method is to boil the liquid and bone-black together, and then strain through filtering-paper or cloth. The composition of bone-black in 100 parts is 10 of pure charcoal, associated with 90 of earthy salts —that is, in the proportion of 1 of pure charcoal in 10 of the commercial bone-black. The power of absorbing colors appears to be due to the porosity of the substance, and is not resident simply in the pure charcoal; indeed, the earthy matters (principally phosphate of lime and carbonate of lime) can be dissolved out of the bone-black by dilute hydrochloric acid, and the pure charcoal thus obtained only possesses about one third the decolorizing power of the total amount of bone-black it was obtained from. Thus, if 100 parts of ordinary bone-black have the power of arresting the color from *ten* volumes of a given colored liquid, then the 10 parts of pure charcoal which can be obtained from the 100 parts of bone-black will be found to decolorize only *three* volumes of the same colored liquid; so that it is apparent the earthy matters in the bone-black influence and increase the absorption of the coloring matter, and thus render a given weight of the charcoal of greater commercial value. When syrup of sugar and other liquids have been run through bone-black for some time, the pores of the latter appear to get clogged with the color, and the clarifying influence ceases, and then the bone-black requires to undergo the process of *revirification*, which consists in reheating it carefully in ovens, or iron pipes inclosed in a furnace, when the absorbed color is charred, and the bone-black can be of service once again as an arrester of color. After several reburnings, the bone-black becomes of very inferior absorptive quality, and is then disposed of for the manufacture of bone-ash and dissolved bones (q.v.). Bone-black has likewise a great power of absorbing odors, especially those of a disagreeable nature, and can thus be employed to deodorize apartments, clothing, outhouses, etc., or wherever animal matter may be passing into a state of active putrefaction.

BONE CAVES, natural excavations containing bones of extinct animals. In England there is one at Kirksdale, in Yorkshire, and one at Bristol; in France there are several in the valley of the Dordogne; there is one at Gailenreuth in Bavaria; and others

are in Belgium and Sicily. They are found also in the United States, Mexico, and Brazil. The bones most commonly found are those of the mammoth, rhinoceros, bear, hyena, and lion, and many of herbivorous animals. The caves in England were frequented by hyenas, those on the continent chiefly by bears. In the caves in southern France there have been discovered relics of man and his tools of the stone age, a fact that is thought to point to a high antiquity for the race, as the accompanying bones of animals were not of those domesticated or subjugated by him.

BONE-DUST is obtained by reducing bones to a fine state of division, either under heavy revolving wheels, or by passing them through toothed iron rollers. In order to facilitate the pulverization of the bone, it is occasionally first subjected to the action of hot water and steam in a digester at a temperature of 270° to 280° F., which dissolves out two thirds of the gelatine, and leaves a very friable mass, which can be reduced to powder even when pressed between the fingers. Bone-dust is used in agriculture as a fertilizing agent, either in its ordinary insoluble condition, when the beneficial effects on the land are prolonged over a series of years, or as dissolved bones (q.v.), when the fertilizing force is exerted principally the first year. See BONES AS MANURE.

BONE GELATINE. See GELATINE.

BONER, ULRICH, one of the oldest German fabulists, was a preaching friar of Bern, and is frequently mentioned in documents of the years 1324–1349. He flourished just when the minnesingers and poets of chivalry had passed away. His collection of 100 fables, or "examples," as they used to be called, was entitled *Der Edelstein* (The Precious Stone), and was first printed at Bamberg, 1461. It is marked by purity of style, and by clear and vivid delineation. This book is one of the greatest of all bibliographical rarities, for, at present, only one copy—that in the Wolfenbüttel library—is known. It is decorated with woodcuts. Bodmer and Breitinger published a complete edition of the work at Zürich, in 1757.

BONES, DISSOLVED, a manure prepared by acting upon bone-dust by sulphuric acid of specific gravity 1600. About 15 cwt. of sulphuric acid (of specific gravity 1660) is added to every ton of bone-dust in a mixing vessel, where the whole can be thoroughly incorporated together. The resulting mass is allowed to lie in a heap for several months, during which time it dries up, and when sent into market, is a dark-colored, coarse, soft powder. The original bone-dust contains a large percentage of insoluble or tribasic phosphate of lime (CaO,CaO,CaO,PO_5); and two equivalents of sulphuric acid (HO,SO_3) acting thereon, abstract two of the atoms of lime, and form two equivalents of sulphate of lime (CaO,SO_3), and one atom of the acid phosphate of lime (HO,HO,CaO,PO_5), which are soluble in water. As the gelatine of the B. hinders the sulphuric acid from acting fully on the earthy matter, it is customary to use a good proportion of bone-ash along with the bone-dust, and the absence of gelatine in the former admits of the acid doing its proper work. Very often, bone-ash is alone used in the preparation of dissolved B., and then the manufactured material, containing no gelatine or animal matter, receives the name of *superphosphate of lime*, or simply, *superphosphate*. In place of bone-ash, much bony matter or phosphate of lime, in the form of Apatite (q.v.) and Coprolites (q.v.), is now employed in part in the manufacture of some varieties of dissolved bones. The present value of dissolved B. ranges from £6 to £8 per ton, according to quality; and they contain from 20 to 35 per cent of soluble phosphate of lime, and 15 to 3 per cent of undissolved or insoluble phosphates. This material is very largely employed as a manure in Britain, and is eminently suitable for the cultivation of the root-crops, such as turnips, mangel-wurzel, etc.; and, associated with 12 to 20 per cent of sulphate of ammonia (q.v.), or nitrate of soda, it rivals Peruvian guano in its fertilizing effects on land where cereals—wheat, barley, oats, etc.—are growing.

BONES AS MANURE. The employment of bones as a manure is one of the greatest modern improvements in agriculture. They are applied either simply reduced to small fragments or a coarse powder called *bone dust* (q.v.), or, after undergoing chemical preparations of various kinds, as the basis of highly valuable artificial manures.—See BONE-ASH, and BONES, DISSOLVED.—All the substances which enter into the composition of bones are desirable additions to the soil, but particularly the phosphates. Phosphoric acid, usually found in combination with magnesia, and more particularly lime, enters into the structure of every plant and animal; it is a substance, therefore, which cannot be dispensed with either in the vegetable or animal economy. Being very sparingly diffused through most soils, it is often essential to add it artificially. The productiveness in many districts of Britain had become much impaired by the diminution of phosphoric acid in the soil, owing to the quantity taken off in corn, cheese, and the B. of animals, which were annually raised and exported. The fine red sandstone loams of Cheshire were comparatively sterile in the end of the last century, which was entirely owing to the deficiency of phosphoric acid in the soil, no doubt partly to be attributed to the quantity yearly abstracted by the dairy produce sent to market. So much was this the case, that a liberal dressing of common or calcined B. had the effect of at once doubling the value of the worn-out pastures. In other parts of Britain, however, such as the clay-soils of Suffolk—which at one time were under dairy-farms—the soil is rich in phosphates, and the application of B. as a manure is there attended with little effect.

It becomes, therefore, of practical importance to ascertain when this substance should be added, and when it is not necessary to do so. It is important to observe, that although phosphoric acid is as essential to one crop as to another, yet some crops, such as turnips, require a far more liberal *artificial* supply of it than others, or wheat, which actually require as much to build up their structure. We will shortly state the principles which should regulate the practice of bone-manuring.

All perennial plants, such as grasses, are enabled to extract phosphoric acid from the soil more readily than annual plants, owing to their numerous and well-developed roots, which are ready, even at the beginning of the growing season, to draw supplies from a large mass of soil. Grasses, therefore, are only benefited by phosphoric manures when the soil is more than usually deficient in phosphates. If grass-lands are sterile, it is easy to ascertain if a deficiency of phosphoric acid is the cause, by adding calcined or crushed B., and watching their effect. An experiment of this sort is a much better guide than any analysis of the soil. In Cheshire, the quantity of B. applied to the pastures is from half a ton to a ton per acre; and this dressing will last from 16 to 25 years.

Wheat, also, from the long time it occupies the ground before it is ready to be reaped, and its slow growth during its early stages, can thrive with a small supply of phosphates. These substances are, therefore, comparatively seldom applied directly as a manure for this crop. So, also, with early-sown oats or barley. When these latter crops, however, are late sown, and the rapidly growing conditions of heat and moisture exist, phosphates are often applied with great benefit.

It is as an application to the turnip that phosphoric acid is so marked in its effects, even when the soil already contains it in considerable quantity. The reason of this is not difficult to trace. The seed of the turnip is small, and it is sown at the warm season, when the growth is rapid. The seeds themselves have only a limited quantity of phosphates stored up for the benefit of the roots and leaves of the young plants. Unless the roots, therefore, while yet short, meet with a concentrated supply, the other elements of the food of the plant—carbonic acid, water, and ammonia—however abundantly they may be present, cannot be assimilated, and its growth is arrested. Besides, a liberal supply of phosphates has the effect of pushing on the turnip through its early stages, when it is so liable to injury from various insects.

The effects of B. as a manure for the turnip are greatly increased by dissolving them in sulphuric acid, and manufacturing the soluble superphosphate of lime. Liebig suggested such a use of sulphuric acid in 1839, and since then, hundreds of manufactories of this manure have arisen over the land. The utility of the discovery, however, is not at present so great as is sometimes represented, owing to the large supply of phosphatic guanos now in the market. In these the phosphate of lime is in a finely divided state, and is readily enough taken up by plants without being dissolved by acids. No doubt, as the scarcity of guano begins to be experienced, and its price rises, it will again become a much greater object than at present to manufacture superphosphate from mineral phosphates or bones. Three to four cwts. of dissolved B. or of phosphatic guano is the quantity usually applied to an acre of turnips.

The value of B. as a manure has been long known in some parts of England, but their use was merely local, until more than two decades of the 19th c. had passed; and they were merely broken by a hammer, or rudely or imperfectly crushed by being laid in ruts where cart-wheels might pass over them. The first machines for bone-crushing were employed in Yorkshire and Lincolnshire in 1814 or 1815, and reduced them only to pieces about the size of a walnut, much larger than the coarsest or "rough" bone-dust now in use. The employment of this manure did not become general in Scotland till about 1830, although it had been introduced in East Lothian some years before. Its use has now extended to different parts of the continent of Europe and to North America.

BONESET, or THOROUGHWORT, *eupatorium perfoliatum*, a perennial herb growing in moist soil, much used in the country as a tonic. It has a strong bitter taste, and is taken in the form of hot tea to produce perspiration. If very strong it operates as an emetic. To make B. tea, steep an ounce of dried leaves in a pint of water; let it stand two hours, and strain. It is often used as a substitute for quinine in agues and light fevers.

BONET, JOHN PAUL, a Spaniard of the 17th c., one of the first instructors of deaf mutes. Only one person before him had been at all successful in the art, and about him, B. does not appear to have known anything, so that he is really entitled to the claim of originality in his method, which consisted in imparting instruction by the sight instead of by the ear—gestures, writing, a manual alphabet, and an artificial pronunciation, being the means employed. His plan is minutely detailed in a volume published by him at Madrid in 1620, entitled *Reduccion de las Lettras, y Arte para enseñar a hablar los Mudos*. The manual alphabet now in use at almost all deaf and dumb institutions in Europe and America, differs little from that introduced by Bonet.

BONFIRE, a fire kindled for some purpose of public rejoicing, usually in an open conspicuous place, as the top of a hill, or the center of a village-green. The burning materials consist of tar-barrels, coal, and other combustibles. The practice of kindling

fires of this kind is of so great antiquity in England, Ireland, and Scotland, as to be traced to pagan rites. See BELTEIN. It was customary to kindle one of these fires in token of rejoicing on midsummer eve—the evening before the 24th of June, which day was appropriated by the church for the feast of St. John the Baptist. Reference is made to bonfires on this occasion by George in his translation of the poet Naogeorgus:

> Then doth the joyfull feast of John the Baptist take his turne.
> When bonfires great, with loftie flame, in everie towne doe burne;
> And young men round about with maides doe dance in everie streete,
> With garlands wrought of motherwort, or else with vervain sweete, etc.

For much antiquarian lore on this subject, see Brand's *Popular Antiquities*, edited by sir Henry Ellis, vol. i. The origin of the word B. has been very puzzling to etymologists. In Scotland, the popular term is *banefire* or *bainfire*, which Jamieson says is apparently a corruption of bailfire, which may be doubted. The most probable etymology is the Welsh *ban*, high, whence *ban-ffagl*, a lofty blaze, a bonfire. The same hills that in English are called *beacons*, are in Welsh called *bans* or *vans*. In Danish, also, *baun* is a beacon, and may be traced in such names as *Banbury*.

BON'GAR, *Bungarus* or *pseudoboa*, a genus of venomous serpents, allied to the genera *elaps* and *naja*, and distinguished by a much keeled back, which has a row of hexagonal scales larger than the rest. The head is broad and depressed, with very strong bones. The species, which appear to be few—only two being certainly known—are natives of the East Indies. They are called rock snakes in India. *B. annularis*, which has the body surrounded with rings of black and yellow, attains a length of six or eight feet.

BONGARDIA, a genus of herbaceous plants of the natural order *berberideæ* (q.v.), natives of the east. One species (*B. rauwolfii*) produces tubers, which are eaten, either boiled or roasted, in Persia; and the leaves of another (*B. chrysogonum*) have an acid taste, and are eaten as a salad.

BONGAY', an island of the East Indian archipelago, to the east of Celebes. It gives name to a group of islets, which supplies the neighborhood with slaves and wood.

BONGO, a people of central Africa in the region between 6° and 8° n., and 27° and 29° e., on the tributaries of the White Nile. They are a short-headed race, of medium height, reddish-brown complexion, and black hair. They subsist on sorghum, which they cultivate, fruits, tubers, and fungi that grow naturally, and for meat they eat any living creature—bird, beast, and reptile—except the dog. Tobacco is raised and smoked. They have no cotton or flax, and for the most part wear no more clothing than an ornamental girdle about the loins. They have goats, dogs, and poultry, but cattle and sheep are rare. Iron is plentiful, and is worked with much skill for use and for ornament. Iron also forms their currency. They have drums, horns, and stringed instruments, in which they take great delight. Marriage is by purchase, and no man is allowed more than three wives. Tattooing is practiced to some extent. Their sepulture resembles that of the Peruvians, the corpse being found in a crouching position with the knees drawn up to the chin; the tombs are frequently marked by rough wooden figures intended to represent the deceased. Of the immortality of the soul they seem to have no notion; and their nearest approach to an idea of a Deity is manifested in a vague reverence for luck; but they believe intensely in goblins and witches in great variety, which are identified with owls, bats, and other noxious animals. Their language is copious and musical, abounding in the vowels *O* and *A*, and is of simple grammatical structure. They number less than 100,000, and are subject to the people of Khartoom.

BONHEUR, ROSALIE (more commonly called ROSA), a female French artist, b. at Bordeaux on the 22d of Mar., 1822. Her first master was her own father, Raymond Bonheur, an artist of merit, who died in 1853. In 1841, Mademoiselle B. contributed for the first time two small pictures to the French exhibition, "Two Rabbits," and "Goats and Sheep," which indicated the department in which she was to attain such eminence. These were followed by a succession of highly finished compositions; the year 1849 producing what some consider her finest picture, "Tillage in Nivernais," which has been placed in the collection of the Luxembourg. In 1853, her famous "Horse Fair" was the principal attraction of the Parisian exhibition; and in 1865 she sent to the universal exhibition at Paris a new landscape of large dimensions, "The Haymaking Season in Auvergne." Since 1849, Mademoiselle B. has directed the gratuitous school of design for young girls. During the siege of Paris, 1870–71, her studio and residence at Fontainebleau were spared and respected by special order of the crown prince of Prussia.

BONHOMME, a co. in s.e. Dakota, on the Missouri river; 525 sq. m.; pop. '70, 608; '80, 5561. It is an agricultural region. Co. seat, Bonhomme.

BO'NI, or BO'NY, a kingdom of the s.w. peninsula of the island of Celebes, in the South Pacific ocean. It was formerly the most powerful state in Celebes, but since 1859 has been practically a Dutch dependency. In the n., the scenery is fine, and the soil fertile—rice, sago, and cassia being produced. The inhabitants engage in agriculture and in the manufacture of cotton, and articles of gold and iron, in which they have a large trade. Their institutions, said to be very ancient, partake of the character of a

constitutional monarchy. The British have twice attacked the Bonese for injuring their commerce, and selling the crews of British ships into slavery. In the second attack, in 1814, the Bonese king was killed. Pop. 200,000.—B., GULF OF, separates the s.e. and s.w. peninsulas of Celebes. It is 200 m. long, and 40 to 80 m. broad. Numerous shoals render its navigation difficult.

BONIFACE, the name of nine popes, most of whom are of no historic note.—B. I. (418-422) was appointed, contrary to canonical rule, by the emperor Theodosius II., upon account of prevailing party divisions. He was the first who assumed as bishop of Rome the title of first bishop of Christendom.—Boniface III., who was pope only for ten months in the year 607, was the first to whom the title of universal bishop of Christendom was conceded by the Greek emperor (Phocas).—B. VIII., previously Benedict Cajetan, a native of Anagni, was elected pope on Dec. 24, 1294. His inauguration was distinguished by great pomp: the kings of Hungary and Sicily held the reins of his horse as he proceeded to the Lateran, and with their crowns upon their heads, served him at table. He failed, however, in his attempts to assert a feudal superiority over Sicily, and to exercise his papal authority in the disputes between France and England. Philip the fair, of France, supported by his states and clergy, maintained the independence of the kingdom, disregarding many bulls and briefs, and even the sentence of excommunication to which the pope proceeded. Philip at last, with the aid of Italian enemies of B., made him prisoner at Anagni, to which he had fled; and although he was liberated by the people of Anagni after two days' imprisonment, he died within about a month (1303 A.D.), in consequence of having refused food during these two days, through fear of poison. He instituted the Roman jubilee in the year 1300. If the charges, however, which Philip the fair brought against B. in self-defense—viz., heresy, simony, licentiousness, etc.—were well founded, and regarding the second there can be no doubt, Dante was quite justified in giving him a place in hell. Apart from the question of his personal character, B. was undoubtedly one of those dangerous ecclesiastics in whose downfall civilization exults.—B. IX. (Peter Tomacelli), a native of Naples, succeeded Urban VI. as pope at Rome in 1389, whilst Clement VII. was pope at Avignon. He exceeded all his predecessors in the shameless sale of ecclesiastical offices and benefices, and of dispensations and indulgences. He acquired, after a struggle, a most despotic power in Rome, which he kept in awe by fortresses; but to secure himself against external enemies, particularly Louis of Anjou, whose claim to the crown of Naples he had opposed, he was obliged to give away part of his territory in fiefs, as Ferrara to the house of Este. He died in 1404.

BONIFACE, SAINT, "the apostle of Germany," whose original name was Winfried, was born in Devonshire, England, about 680. He first entered a monastery in Exeter, at the age of 13, and afterwards removed to that of Nutcell, where he taught rhetoric, history, and theology, and became a priest at the age of 30. At that time, a movement, proceeding from England and Ireland, was going on for the conversion of the still heathen peoples of Europe; in 614, Gallus and Emmeran had been sent to Alemannia, Kilian (murdered 689) to Bavaria, Willibrord (died 696) to the country of the Franks, Swidvert to Friesland, and Siegfried to Sweden. Winfried, also, took the resolution (715) of preaching Christianity to the Frisians, among whom it had as yet found no entrance. But a war broke out between Charles Martel and the king of the Frisians, and Winfried returned from Utrecht to his convent, of which he became abbot. Still bent upon his design, he repaired to Rome in 718, and received the authorization of pope Gregory II. to preach the gospel to all the tribes of Germany. He went first to Thuringia and Bavaria, then labored 3 years in Friesland, and traveled through Hesse and Saxony, everywhere baptizing multitudes, and consecrating their idolatrous groves as churches. In 723, Gregory II. called him to Rome; made him bishop, with the name of Bonifacius; furnished him with new instructions or canons, and with letters to Charles Martel and all princes and bishops, requesting their aid in his pious work. Returning to Hesse (724), he destroyed the objects of heathen worship (among which are mentioned an oak near Geismar, sacred to Thor, and an idol named Stuffo, on a summit of the Harz, still called Stuffenberg), founded churches and convents, and called to his aid priests, monks, and nuns from England, whom he distributed through the various countries. In recognition of his eminent services, Gregory III. sent him (732) the pallium, and named him archbishop and primate of all Germany, with power to establish bishoprics wherever he saw fit. B. now made a third journey to Rome (738), and was appointed papal legate for Germany. The bishoprics of Regensburg, Erfurt, Paderborn, Würzburg, Eichstädt, Salzburg, and several others, owe their establishment to St. Boniface. The famous abbey of Fulda is also one of his foundations. He was named archbishop of Mainz by Pipin, whom he consecrated as king of the Franks at Soissons (752), and he presided in the council held at that place. In 754, he resumed anew his apostolical labors among the Frisians; and at Dokkum, about 18 m. n.e. of Leeuwarden, in w. Friesland, this venerable Christian hero was fallen upon by a mob of armed heathens, and killed, along with the congregation of converts that were with him (755). His remains were taken first to Utrecht, then to Mainz, and finally to Fulda. In the abbey, there are still shown a copy of the gospels written by him, and a leaf stained with his blood. A collection of his letters, and the canons he promulgated for

the discipline of the newly established churches, have been preserved, and are instructive as to the state of Germany at the time. The completest edition of the Letters (Epistolæ) is that of Würdtwein (Mainz, 1789). In 1811, a monument was erected to St. B. on a hill near Altenberga, in the principality of Gotha, where, according to tradition, he had erected (724) the first Christian church in North Germany. A statue by Henschel of Cassel was also erected to him in Fulda in 1842. Rittberg, *Kirchengeschichte Deutschlands* (vols. i. and ii., Gott. 1845).

BONIFA'CIO, STRAIT OF, the modern name of the strait between Corsica and Sardinia, the *Fretum Gallicum* of the Romans. At the narrowest part it is only 7 m. wide. The navigation is difficult, owing to the great number of rocks, which, however, are favorable to the production of coral, and the coral and tunny fisheries are actively prosecuted. At the eastern entrance of the strait lie the Bucinaric or Magdalen islands, the *insulæ Cuniculariæ* of the ancients, principally inhabited by Corsicans, but mostly belonging to Sardinia. The strait receives its name from the small town of Bonifacio in Corsica, strongly situated upon a rocky promontory, with an excellent harbor and 3300 inhabitants. It was a place of much consequence to the Genoese for the security of their trade in these seas, and a number of very fine churches still attest its former greatness.

BONIL'LO, a t. of Spain, in the province of Albacete, and 34 m. w.n.w. from Albacete. Pop. 5980.

BONIN, or **ARCHBISHOP ISLANDS,** in the Pacific, stretching in n. lat. between 26° 30′ and 27° 44′, and in e. long. between 142° and 143°. They were discovered in 1827 by capt. Beechey of the *Blossom*, who took formal possession of them for England. They would appear to have been then uninhabited, though at one time a Japanese colony. In 1830, however, Peel island, near the center of the group, was settled, in connection with the whaling business, by a motley colony—an Englishman, an Italian, a Dane, 2 Americans, and 15 Sandwich islanders (5 men and 10 women)—under the auspices of a "union-jack." The inhabitants adopted a constitution in 1853. Besides pigs, goats, and fowls, Peel island produces sweet potatoes, maize, onions, yams, pumpkins, melons, lemons, tobacco, and sugar-cane. Timber also is plentiful, though not of sufficient size for masts.

BONIN (or ARCHBISHOP) ISLANDS (*ante*), called by the Japanese OGASAWARA, after the daimio who first held them in fief in 1593, or after the navigator of the same name who visited them later. In 1675, a party of Japanese explorers from Nagasaki visited them, and finding them uninhabited, called them Bunin ("no man's"), whence our Bonin. In 1823, capt. Coffin, of the American whaler *Transit*, landed on the most southern island, and named it after himself, which capt. Beechey knew when he arrived in 1826. In 1854, com. M. C. Perry stocked the island with sheep, goats, and cattle, and Bayard Taylor wrote a fine description of the group. In 1877, there were on the island 25 Americans, 17 Englishmen, and a motley company of Hawaiians and others, numbering in all 70 persons. In 1878, it was formally taken possession of, colonized, and a local government established by the mikado. Coffin island is the suggested site of the terminus of the proposed trans-Pacific submarine cable from California to Japan.

BONI'TO, a name common to several fishes of the mackerel family, or *scomberidæ* (q.v.). One of these, *thynnus pelamys*, sometimes called the stripe-bellied tunny, and of the same genus with the tunny (q.v.), is well known to sailors as an inhabitant of tropical seas, and as one of the fishes most frequently seen pursuing the flying-fish. It is often taken by an imitation flying-fish made to skim along and touch the waves. Its flesh, although relished by those who have been previously confined to salt provisions, is dry. It is occasionally but rarely caught on the British coasts. It is a very beautiful fish, seldom exceeding 30 in. in length, of a beautiful steel-blue color, darker on the back, and whitish below. Four dark lines extend along each side of the belly. The general form resembles that of the mackerel, but is less compressed.—The B. of the Mediterranean (*pelamys sarda*) is a fish very similar to this, but of an allied genus, distinguished by its comparatively large and strong teeth. It has dark transverse bars reaching from the ridge of the back to the lateral line. It is plentiful in the Black sea. —The plain B. (*auxis vulgaris* or *A. rocheanus*) may be distinguished at once from both of these by its more uniform blue color, without stripes or bands, and by the widely separated dorsal fins. It has only one row of minute teeth in each jaw. It is found in the Mediterranean, and in some places seems to bear, in common with the last-mentioned species, the name bonito. Its flesh is little esteemed when fresh; it is generally used either salted or pickled. Like mackerel, it putrefies rapidly, unless means are used for its preservation. This fish has been occasionally caught on the coast of England, and one was taken in summer 1859, in a herring-net, off the coast of Banffshire.—Another species of *auxis*, a native of the West Indian seas, equals the tunny in size.

BONN, a t. of Rhenish Prussia, beautifully situated on the left bank of the Rhine, 15 m. above Cologne. Pop. '75, inclusive of the military, 28,114. B. is connected with the right bank of the Rhine only by a ferry, and with Cologne by the railway as well as the river. The cathedral church is a fine specimen of the last period of the Romanesque style, and exhibits the transition to the Gothic already begun. B. has considerable manufactures of cotton goods, earthenware, vitriol, and soap. The neighborhood is

very romantic. B. is the seat of a number of learned associations and institutions. The Leopoldine academy of physical science, founded at Vienna in 1652, was transferred to B. in 1818. It obtained a university in 1786, which, however, was suppressed during the sway of France; and the present university was founded in 1818, receiving from government the former electoral palace and other buildings, with an annual revenue of nearly £15,000 sterling. There are two theological faculties, the one Protestant, and the other Roman Catholic. The university had, in 1875, 102 professors and lecturers, and 724 students; and among its professors have been numbered some men of high distinction, as Niebuhr and A. W. Schlegel. Albert, the late prince consort, was a student here. Its clinical establishments are of unusual extent, and admirably arranged. It has a library of above 200,000 volumes, archæological and other collections, a botanic-garden, an observatory, an agricultural school, a riding-school, etc. B. derives its origin from *Bonna*, one of the castles erected by the Romans in Germany. It was long the residence of the electors of Cologne; it was taken from the French in 1689, after a severe bombardment by the elector Frederic III. of Brandenburg; and in 1703, it surrendered, after a siege, to the English and Dutch army under Marlborough. It returned again into the possession of the elector of Cologne in 1715, and in 1717 its fortifications were razed. It was acquired by France in 1802, and assigned to Prussia in 1814. Beethoven was a native of Bonn.

BONNER, EDMUND, Bishop of London, was b. of obscure and doubtful parentage, about the end of the 15th century. The reputation he gained at Oxford by his knowledge of the canon law, recommended him to the notice of Wolsey, who promoted him to several offices in the church. After the fall of Wolsey, B. took an active share in the work of reformation, and received due promotion from Henry VIII. In 1533, he was deputed to appear before the pope at Marseilles, to appeal for the excommunicated monarch to a general council. The violence of his threats on this occasion suggested to his holiness the fitness of having him burned alive, or thrown into a caldron of melted lead, so that B. judged it prudent to leave Marseilles without notice. In 1540, he was made bishop of London. The death of Henry cooled his Protestant zeal; and having given proofs of his lukewarmness in the cause of reformation, he was at length, in 1549, committed to the Marshalsea, and deprived of his bishopric. The accession of queen Mary restored him to office, and gave him the opportunity of revenge, which he now took without delay or stint. As vice-gerent and president of the convocation, he was the principal agent in that bloody persecution which has made the reign of Mary infamous. On the accession of Elizabeth in 1558, B. accompanied his episcopal brethren to salute her at Highgate, but was excepted from the honor of kissing her hand. In May, 1559, he was summoned before the privy council, and refused, with a consistency worthy of due respect, to take the oath of supremacy. He was accordingly deposed from his bishopric, and shut up in the Marshalsea, where he died in 1569. While it is right to remember with detestation the multitude of B.'s cruelties, one also ought not to forget that he was strict in castigating the lax morality of his clergy; that after his return to popery, he remained steadfast to his principles; and that he bore his final misfortune with manly resignation.

BONNER, ROBERT, b. 1824; a printer who established the *New York Ledger* in 1851, and by a new and attractive system of advertising acquired for it an unprecedented circulation. It is a family literary journal, without advertisements. B. is also known as an owner of fast horses, and has had at one time more than a hundred of the most valuable, obtained without regard to cost.

BONNET, in fortification, is a small defense-work constructed at the salient angles of the glacis or larger works. It consists of two faces only, with a parapet 3 ft. high by 10 or 12 broad. There is no ditch. A larger kind, with three salient angles, is called a priest's B., or *bonnet à prêtre*. The use of the B. is to check the besiegers when they are attempting to make a lodgment.

BONNET, a covering for the head, of which there are many varieties. The French, from whom we have the word, apply it as we do to male as well as female head-dress. A kind of night-cap is called by them a B ; as, for example, the *bonnet rouge*, or infamous "cap of liberty" of the revolutionary leaders. The English B. of former times was made of cloth, silk, or velvet, less or more ornamented, according to the means or taste of the wearer. This species of head-gear was generally superseded by the hat, in the early part of the 16th c.; but in Scotland, bonnets were universally worn for a century to two centuries later, and they still remain to a certain extent a national characteristic. From the frequent notice of the blue B. in historical records and in song, it would seem that the Scotch were long identified with this kind of head covering. The genuine old B. of the Lowland Scottish peasantry was of a broad, round, and flat shape, overshadowing the face and neck, and of a dark-blue color, excepting a red tuft like a cherry on the top. The fabric was of thick milled woolen, without seam or lining, and so exceedingly durable that, with reasonable care, a single B. worth about 2*s.* would have served a man his whole life. No head-dress ever invented could stand so much rough usage. It might be folded up and put in the pocket, or laid flat and sat upon, with equal impunity; it might be exposed to a heavy drenching rain without the head being wetted, and when dried, it was as good as ever. Besides it could be worn on the top of the head, or slouched

in front, behind, or sidewise, as a protective against a cold blast; and from its softness and elasticity, it very fairly saved the head from the effects of a blow. In short, there was no end to the adaptability of the old "braid bannet," as the Scotch termed it; and one almost feels a degree of regret that, in the progress of fashion, it should have gone so much out of use. From having been worn, till comparatively late times, by small rural proprietors—such as owners of a cottage and an acre or two of land—it gave to these local notabilities the distinctive appellation of *bonnet lairds*. A lesser and not so broad a variety of the B. was worn by boys. The Highlanders have long worn bonnets of the same fabric, but these rise to a point in front, and are without any rim. Such is the cap now known as the *Glengarry bonnet*. From time immemorial, these various kinds of Scots bonnets have been manufactured at Stewarton, a small town in Ayrshire. Formerly, the Stewarton bonnet makers formed a corporation, which, like other old guilds, was governed by regulations conceived in a narrow and often amusingly absurd spirit; one of the rules of the fraternity, however, can be spoken of only with commendation, for it enforced a certain weight of material in each B., as well as durability in the color. An account of this ancient corporation will be found in *Chambers's Journal*, first series, vol. v., p. 142. The bonnets used in the Highland regiments are made at Stewarton and Kilmarnock; they are usually distinguished by a checkered fillet, being the *tressé chequé* of the house of Stuart. Latterly, although hats and caps have, to a great extent, superseded bonnets of the old varieties, the bonnet manufactories of Stewarton have much increased, and are still increasing. Of the many and ever-shifting varieties of ladies' bonnets of straw, silk, and other materials, we not need attempt any account.

BONNET, CHARLES, an eminent naturalist and philosopher, b. at Geneva, 13th Mar., 1720. He was educated for the profession of the law, but devoted himself at a very early age to the study of natural history. A dissertation on aphides obtained for him, in 1740, the honor of being made a corresponding member of the academy of sciences in Paris. He was soon afterwards occupied in researches concerning polypi, the respiration of insects, the structure of the tape-worm, etc. He published his *Traité d'Insectologie* (2 vols., Par.) in 1745. His *Recherches sur l'Usage des Feuilles des Plantes*, published in 1754, contained the result of much observation on important points of vegetable physiology. A severe inflammation of the eyes, putting a stop for two years to his researches in natural history, gave another direction to his studies, and he published several works on psychology, in which materialistic views decidedly prevail; the body is represented as the original source of all the inclinations of the soul, and all ideas are referred to movements of the nervous fibers; but his religious convictions remained always strong and unshaken, and in his *Idées sur l'Etat Futur des Etres Vivants, ou Palingénésie Philosophique* (2 vols., Gen. 1769), he endeavored to demonstrate the reasonableness of the Christian revelation. In this work he also maintained the future life of all living creatures, and the perfection of their faculties in a future state. Lavater translated the last part of it, and it helped to effect a change in the religious tendencies of Mendelssohn. His *Considérations sur les Corps Organisés* (2 vols., Gen. 1762) is very much devoted to an examination of the theories of generation. B. was for some years a member of the great council of his native city. He died on 20th May, 1793. In the latter part of his life, he superintended a collective edition of his own works (8 vols. and 18 vols., Neuch. 1779–88).

BONNET-PIECE, a gold coin of James V. of Scotland, so called on account of the king's head being decorated with a bonnet instead of a crown, as was usual. James V. was the first Scottish sovereign who placed dates on his money, and the first who diminished the size of the gold coins "by increasing their thickness. The most remarkable are those commonly called the bonnet-pieces, which were struck of native gold; in beauty and elegance of workmanship, they approach the nearest to the Roman coins, and very much surpass all the coinage at that period, or ever since." These bonnet-pieces are among the most valued curiosities of the antiquary.

BONNEVAL, CLAUDE ALEXANDRE, Count de, also called Achmed Pasha, a French adventurer, whose history is very extraordinary. He was born of a noble family at Coussac, in Limousin, in 1675; proved unmanageable at the Jesuit college; and was placed in the royal marine corps in his 13th year. He was transferred to the guards; served with great distinction in Italy and the Netherlands; but having been refused promotion, upon account of some excesses of which he had been guilty, he behaved with great insolence to the minister at war, and was therefore condemned to death by a court-martial. Foreseeing this result, he fled to Germany, where, upon the recommendation of prince Eugene, he obtained employment in the Austrian service. He now fought against his native country, distinguished himself by many daring exploits, was raised to the rank of lieut.-field-marshal, and bore a principal part under prince Eugene in the war between Turkey and Austria. But when residing at Vienna, after the peace of Passarowitz, he made himself very disagreeable to the prince, and was therefore sent, in 1723, as master-gen. of ordnance to the Netherlands, where he soon got into a scandalous quarrel with the governor, and was brought to trial, and condemned to death by a court-martial. The emperor commuted the sentence to one year's imprisonment; and upon condition of never again setting foot upon German soil, he was conveyed across the Tyrolese frontier. He went to Constantinople, was cordially welcomed, became a

Mohammedan, took the name of Achmed, was made a pasha of three tails, was employed in organizing the Turkish artillery after the European manner, achieved successes as general of a division of 20,000 men in the war of the Porte with Russia, and arrested the victorious career of the Persian usurper, Thamasp Kuli Khan. For this service, the sultan appointed him governor of Chios; but his own imprudence, and the envy of others, caused his removal from this office. He now thought of leaving Turkey, but died at Constantinople on 27th Mar., 1747. The memoirs published as his are spurious.

BONNEVILLE, Benjamin L. E., b. France about 1795, a graduate of West Point. In 1820, he was constructing a military road in Mississippi; next on frontier duty, and in 1831 started on an exploring expedition to the Rocky mountains and was not heard from for several years. He served in the Florida and Mexican wars, rising to the grade of col., and in 1861 was retired on account of disability, but served during the civil war as superintendent of the recruiting service in Missouri, being raised to brig-gen. in 1865. Washington Irving edited the *Adventures of Captain Bonneville, U.S.A., in the Rocky Mountains and the Far West.*

BONNIVARD, François de, 1496–1570; the "prisoner of Chillon." He was educated at Turin, and in 1510 succeeded to the priory of St. Victor, near Geneva. He upheld the cause of the Genevese against the duke of Savoy, and when the duke took the city he was imprisoned for two years. Being liberated, he returned to his priory; but in 1530, while traveling in the service of the republic, he was captured by robbers, and given to his enemy the duke, who imprisoned him in the castle of Chillon until 1536, when he was liberated by the Bernese and Genevese forces. He returned to Geneva (which city was now entirely emancipated), and enjoyed the honors and rewards due to his patriotism, being made one of the council of two hundred. He was the author of a history of Geneva, and left his books and manuscripts to that town.

BONNYCASTLE, Charles, 1792–1840; b. in England; son of John, the English mathematician. He assisted in compiling his father's text books, and was the first professor of natural philosophy in the university of Virginia, and also professor of mathematics. He wrote *Inductive Geometry*, and several papers on scientific topics.

BONNYCASTLE, John, long professor of mathematics at the royal military academy, Woolwich, is well known as the author of many excellent elementary works, chiefly mathematical. He was born at Whitchurch, Buckinghamshire, and died at Woolwich in 1821. His *Elements of Algebra* (2 vols. 8vo, 1813) is selected by a capable critic, from among his other works, as specially deserving of commendation.

BONNY RIVER, a river of Guinea, w. Africa, forming the eastern debouchure of the Niger, and falling into the bight of Biafra, in about lat. 4° 30′ n., and long. 7° 10′ east. It is accessible at all times of the tide to vessels drawing as much as 18 ft. of water, and safe anchorage at all seasons of the year is found within its bar. Its banks are low, swampy, and uncultivated. On the e. side, near its mouth, is the town of Bonny, long notorious as the rendezvous of slave-trading ships. It exports considerable quantities of palm oil.

BONPLAND, Aimé, an eminent botanist, was born at La Rochelle, France, Aug. 22, 1773. Having studied medicine and botany at Paris, he accompanied Alexander von Humboldt in 1799 to America, where they traveled nearly five years, mostly in Mexico and the Andes, during which time B. collected 6000 new species of plants. After his return, he was appointed, in 1804, director of the gardens at Navarre and Malmaison, and published several splendid and valuable botanical works, *Plantes Equinoxiales Recueillies au Merique*, etc. (2 vols., Par. 1808–16, with 140 copper-plates); *Monographie des Mélastomées*, etc. (2 vols., Par. 1809–16, with 120 copper-plates); and *Description des Plantes rares de Navarre et de la Malmaison* (11 numbers, Par. 1813–17, with 64 copper-plates). He went to Buenos Ayres in 1816, with a collection of European plants and fruit-trees, was favorably received by the government, and named professor of natural history. After remaining at Buenos Ayres about five years, B. undertook an expedition of scientific discovery up the Paraña, with the view of prosecuting his investigations to the Andes, across the Gran Chaco desert; but Dr. Francia, then dictator of Paraguay, instead of giving him permission to cross the country, arrested him, after killing some of his men, and kept him prisoner for about nine years, notwithstanding the efforts of the British government, at the instigation of Humboldt, to obtain his release. While detained by Dr. Francia, he acted as physician of a garrison. On the 2d of Feb., 1831, he obtained his liberty, and traveling southward, settled on the southern boundary of Brazil, near the eastern bank of the river Uruguay, and in the vicinity of the small town of San Borja. Here he resided until 1853, taking great interest in cultivating and promoting the cultivation of Paraguay tea, and with no desire to return to Europe. In 1853, he removed to a larger estate at Santa Anna, where he busied himself in cultivating orange-trees of his own planting. In 1857, he wrote to Humboldt that he was about to carry his collections and manuscripts to Paris, to deposit them in the museum there, and that after a short stay in France, he intended to return to Santa Anna. That voyage, his death in 1858 prevented him from accomplishing. His remarks on the herbarium collected in his travels with Humboldt, have been given to the world by Kunth in his *Nova Genera et Species Plantarum* (12 vols., Par. 1815–25, with 700 plates).

BONUS, a special allowance, or extra dividend, to the shareholders of a company. If the previous dividend has been 4 per cent on the capital, and if the profits of the current year admit of 5 per cent, a formal dividend of that amount would commit the company to a like dividend in future; and to prevent such a precedent, 4 per cent is declared, and a B. of 1 per cent.

BONYHAD, or BONHARD, a market t. of Hungary, in the colony of Tolna, 20 m. n.e. from Fünfkirchen. Pop. '69, 5610.

BONY PIKE, *Lepidosteus*, an interesting genus of fishes, being one of the few existing genera belonging to an order, *ganoid fishes* (q.v.), of which the fossil forms are extremely numerous, and the only existing genus, which, upon account of the number and arrangement of the bones of the head and other peculiarities of the skeleton exhibiting a resemblance to reptiles, is reckoned among *sauroid fishes* (q.v.). The body is covered with a case of dense bony square scales, so fitted together as to form a complete coat of mail. The vertebræ are articulated by ball and socket, and the head is capable of a degree of motion upon the trunk very remarkable among fishes, and compensating for the general stiffness of the mailed body, the skeleton of which is also bony, and not cartilaginous. The snout is elongated, and the edges of the jaws are furnished with long teeth, the breadth of the snout in some of the species giving it a resemblance to that of the pike. The tail is *heterocercal*, or unsymmetrical, the caudal rays being inserted not equally above and beneath the termination of the vertical column, but only at and beneath it, a character much more common in fishes of the old red sandstone than in those of the present period.—The species of this genus are pretty numerous, attain a large size, and are found in the rivers and lakes of the warm parts of America. They are much esteemed for the table.

BONZES, the Japanese priests of Fo or Buddha. The name is from the Japanese *Busso*. It was extended by the Portuguese to Buddhist priests in other countries, but particularly to the Chinese. See JAPAN and BUDDHISM.

BOO'BY, *Sula fusca*, a species of gannet (q.v.) which has received this name from its apparent stupidity in allowing itself to be knocked down with a stick or taken by the hand. Accounts differ very much, however, as to this character of the B., some representing it as singular in not taking alarm or becoming more wary even when it has had reason to apprehend danger from man; others, as Audubon, asserting in such a manner as apparently to place it beyond dispute, that it does learn to be upon its guard, and even becomes difficult to approach within reach of shot. The B. is not quite so large as its congener, the common gannet or solan-goose, and, like it, is a bird of powerful wing, and feeds on fish, which it takes by diving in the sea, observing its prey as it sweeps along the graceful and varying flight, sometimes at a height of only a foot or two from the surface of the water, sometimes 20 yards above it, and plunging suddenly to seize it. It is sometimes taken, like the gannet, by means of a fish fastened to a board, through which it drives its bill, as it dashes at the bait. The B. is of a blackish-brown color, whitish beneath; its colors are subject to some variation, and in young birds a general brown color prevails; the sexes differ very little, except that the female is not quite so large as the male. It is found on almost all tropical and sub-tropical shores, and sometimes even 200 m. from land. On the e. coast of North America, it reaches about as far n. as cape Hatteras, but is much more abundant further s., great numbers breeding on the low islands off the coast of Florida. The nest is often placed upon a low bush, and "is large and flat, formed of a few dry sticks, covered and matted with sea-weeds in great quantity." It contains only one egg or young one at a time. The expansibility of the gullet enables the B. to swallow fishes of considerable size. The bill, which is straight, conical, and longer than the head, opens beyond the eyes, as in the rest of this genus. The B. is much persecuted by the frigate bird (q.v.) and man-of-war bird (q.v.), more powerful birds and of swifter flight than itself, which often compel it to disgorge for their use the prey which it has just swallowed. The flesh of the B., although sometimes eaten by sailors, is dark-colored, and not very agreeable. Bligh and his companions, in his long boat-voyage, found one or two which they captured a providential supply of food.

BOO'BY ISLAND, a level rock in Torres straits, in lat. 10° 36′ s., and long. 141° 53′ e., 3 ft. in height, and ¼ m. in diameter. Being, of course, highly dangerous to navigators, and destitute of resources of its own, it is said to be pretty regularly supplied with provisions and water by passing vessels, for the benefit of such as may be cast ashore on it.

BOODROOM, BOUDROUM, or **BODRUN**, a seaport t. in Asiatic Turkey, in the pashalic of Anatolia, finely situated on the n. shore of the gulf of Kos, about 96 m. s. of Smyrna, in lat. 37° 2′ n., and long. 27° 25′ east. It is an uninviting place, its streets being narrow and dirty, and its bazaars of the worst class; but as the site of the ancient *Halicarnassus*, the birth-place of Herodotus and Dionysius, it possesses great interest for the traveler. Many remains of the old city, which was "the largest and strongest in all Caria," bear witness to its former magnificence. A fortress, built by the knights of Rhodes in 1402, occupies a projecting rock on the e. side of the harbor, which is shallow but well sheltered, and resorted to by Turkish cruisers. Some ship-building is carried on. Pop. stated at about 11,000.

BOOK, a distinct literary production in one or more volumes; but the term B. is also applied to a treatise, or group of chapters, forming a part of a volume, and traditionally it signifies a narrative, or record of some kind in the form of a roll: "Lo, a roll of a book was therein; and he spread it before me; and it was written within and without."—*Ezek.* ii. 9, 10. The term has a similar meaning in English law phraseology. "In the court of exchequer, a roll was anciently denominated a book, and so continues in some instances till this day. An oath as old as the time of Edward I. runs in this form: 'And you shall deliver into the exchequer a book fairly written,' etc., but the B. delivered into the court in fulfillment of this oath has always been a roll of parchment."—Godson and Burke *On the Law of Patents and Copyrights* (Lond. 1851, p. 323).

The word B. is from the Anglo-Saxon *boc*, and, with some modifications of spelling, is common to all the Teutonic and Scandinavian languages (Ger., *buch;* Dutch, *boek*). It is believed to be derived from the same root as *beech* (Angl.-Sax. *boc;* Ger. *buche;* Icel. *beyke;* Dutch, *beuke*), the earliest writing among those nations having been executed on the inner bark of the beech-tree, or perhaps carved on beech boards. The Greek word for a B., *biblos*, or more commonly, *biblion*, is derived from the Egyptian appellation for the plant papyrus (q.v.). The Latin word *liber*, a B., is derived from the name of the cellular tissue of the papyrus, instead of the plant itself. By the Greeks, a collection of books was called *bibliotheca*, and by the Romans, *libraria;* hence the French term *bibliotheque*, and the English word *library;* hence, also, the *librarii*, or book-writers, and *bibliopolæ*, booksellers, of the Romans. Properly prepared in long strips, the papyrus was wound round small cylinders, or rollers, which in Latin were styled *columina;* hence the English word volume. As the papyrus has also given the term paper to the moderns, it has played an important part in the naming of what concerns books. Besides papyrus, however, the ancients used parchment and other materials for the fabrication of their books; and when, by the capture of Egypt by the Arabs in the 7th c., the papyrus plant could no longer be procured, parchment was the material generally employed.

By the Romans after the Augustan age, the art of fabricating books reached a degree of proficiency, along with the advancement in literature. The papyrus was carefully prepared; one side was reserved for the writing, and the other was colored with saffron or cedar oil. The writing was effected by a pen made of a reed (*calamus*), of which the best kinds were supposed to be found in Egypt. The ink (*atramentum*) was very durable. In several rolls found at Herculaneum, the Roman ink, after being interred many centuries, is still in good preservation. When a Roman author wished to give his book to the world, a copy was put into the hands of transcribers (*librarii*), by whom a certain number of copies were produced. From these transcribers, who were equivalent to our modern printers, the copies passed to a class of artists (*librarioli*), who ornamented them with fanciful titles, margins, and terminations. The rolls were finished for use by the *bibliopegi*, or book-binders; and last of all, they were offered for sale by the *bibliopolæ*, or book-sellers. A copy of one of the esteemed productions of a Roman author—as, for example, a copy of Virgil or Horace—was an elegantly done-up roll, about 13 in. in depth, wound round a cylinder, the two ends of which were decorated with ivory or metal knobs. Outside, it bore various decorations along with the title, and for safety was put in a neat case of parchment or wood, which also bore sundry ornamental devices, including perhaps a portrait of the author. A book-seller's shop in ancient Rome would probably show a collection of scrolls, less or more ornamented, not unlike in appearance to modern small maps mounted on rollers; and in this form books would be handed about and read. Prized for their rarity and costliness, these scroll-books were kept with great care in cases, or round-shaped boxes with lids, made of cedar; the odor of that wood being a preservative against moths and other destructive insects. Romans with a literary taste carried one of these boxes of scrolls with them as a portable library. A public library comprised a large variety of these boxes, and must have had the appearance of a collection of round canisters. Yet the Romans did not invariably make their books in rolls; in some instances, they used leaves of lead, which had been beaten thin with a hammer, and also leaves of wood covered with wax; these loosely connected at the back with rings, may be viewed as the rude original of the modern book. At Herculaneum, books of this kind, called tablets, have been discovered in perfect preservation.

In producing books during the middle ages, the plan of rolls was dismissed, and that of leaves sewed together and inclosed in boards came generally into use. The material employed was still parchment, prepared from the skins of goats, sheep, deer, and other animals; for although the art of making paper was known in the 9th c., this new material came slowly into use. The fabricators of the books were for the most part different orders of monks, more particularly the Benedictines (q.v.), a learned and industrious body of men, whose peaceful establishments were long the great centers whence literature was dispersed in ages of intellectual darkness and social disorder. At the head of the book-manufacturing department in the monastery was the *armarian*, who, besides taking charge of the library, gave out books to be copied, along with the pens, ink, and parchment required by the transcribers. Some of the monks were allowed to transcribe in the solitude of their cells, but the business of transcription was conducted chiefly in an apartment called the *scriptorium*, which was provided with ranges of desks and forms. There, the scribes or copyists, who were under strict regulations as to keeping silence, carried on their tedious but useful labors. The writing was effected in dis-

tinctly formed letters in an old character; regularity in the lines and pages being secured by previous ruling. There was an injunction that no one should on any account alter a single letter or word, without the sanction of the superior. With all the care that was bestowed, however, errors crept in, and were repeated from copy to copy, some of which mistakes have sorely puzzled the scholarly inquirers of later times. There was a division of labor in the monasteries. To some of the monks was assigned the duty of throwing in embellishments. With leaf-gold and brilliant water-colors, they adorned the devotional works, lives of saints, and copies of the Scriptures with pictorial illustrations and fancifully illuminated letters at the beginning of chapters. By another class of these monkish artists, the books were bound in styles suitable to the quality of the works. In many instances, the binding was superb. The boards of wood, covered with leather or velvet, were decorated with precious stones and devices in metal; and in front, the volume was held together with clasps of gold or silver-gilt. Skelton, the poet-laureate, in his *Garland of Laurel*, written about the year 1510, rapturously alludes to the splendid bindings of those old times:

> With that of the boke losende were the claspis:
> The margent was illumynid all with golden railles
> And byse, enpicturid with gressoppes and waspis,
> With butterflyis and freshe pecoke taylis,
> Enflorid with flowris and slymy snaylis;
> Envivid [enuiuid] picturis well towchid and quikly;
> It would haue made a man hole that had be right sekely,
> To beholde how it was garnisshyd and bounde,
> Encouerde ouer with golde of tissew fyne;
> The claspis and bullyons were worth a thousande pounde;
> With balassis* and charbuncles the borders did shyne;
> With *aurum musicum*† euery other lyne
> Was wrytin: . . . . .

"A book usually known by the name of *Textus Sanctus Cuthberti*, preserved in the Cottonian library, is a fine specimen of Saxon caligraphy and decoration of the 7th century. It was written by Eadfrid, Bishop of Durham; and Ethelwold, his successor, executed the illuminations, the capitals, and other illustrations, with infinite labor and elegance. Bilfrid, a monk of Durham, covered the book and adorned it with gold and silver plates set with precious stones. We find also that Dageus, a monk who flourished in Ireland in the early part of the 6th c., was a skillful caligraphist, and manufactured and ornamented binding in gold, silver, and precious stones."—*Hunnett's Inquiry into the Books of the Ancients* (Lond. 1843). Books of a common quality were plainly bound in parchment, and instead of clasps they were tied in front with thongs. In order to enable monasteries to sustain the expense incurred by their book-fabricating establishments, they were occasionally endowed with lands by pious laymen, the bequests being expressly for "the making and mending of books." Among the works produced were copies of the Scriptures, in whole or in part; breviaries or books of prayers used in the church services; missals, psalters, books in philosophy, and copies of the Greek and Latin classics and fathers; also legends of the saints. Books of history, poetry, romance, etc., were less commonly transcribed; though, from the extent of some of the mediæval libraries, these and various other subjects were not neglected. Indeed, but for the monks we should have possessed scarcely any chronicles of the middle ages; nor are we less indebted to them for the preservation of those classics which are now habitually used in our colleges and academies.

The method of dispersing the books was not less remarkable than that of their transcription. Some of the books were sold at exorbitant prices; some were executed to the order of kings, nobles, and church dignitaries; some were exchanged; and some found their way into the hands of the *stationarii*, or dealers in books, in the principal cities. It was customary to lend books for transcription, under an agreement to receive an additional copy on their return. In all cases of lending books, penalties were stipulated to be paid in the event of their not being restored. Latterly, there sprang up a practice among the *stationarii* of Paris, and some other cities, of lending out books, at certain rates, on the principle of a circulating library (q. v.), by which means the poorer class of students and others were accommodated. In these later times, also, as we approach the period when printing superseded transcription, the process of copying books began to be undertaken by lay scribes for a livelihood, of which there were examples in London. To the monks, however, and also to some orders of nuns, belongs the unspeakable merit of having not only supplied the religious orders with the books which were in daily use, but those which replenished the libraries of the learned and wealthy, until their ingenious craft was supplanted by that of the printer and bookseller. In the higher-class monasteries there were libraries of from 500 to 1,000 volumes; but many of the poorer conventual establishments could boast of no more than from 20 to 30 books. In the list of effects which belonged to a monastery in Scotland—St. Serf, on an island in Loch Leven—there appear only 16 books; and yet, in this poorly provided insular establishment, the prior, Andrew Wintoun (1420), completed his *Oryginale Cronykil of Scotland*, a work in verse, which is not less valuable as a picture of ancient manners than as a specimen of the attainments of the old monkish writers. But there are said to have

* Balassis—rubies.
† *Aurum musicum*—mosaic gold.

been instances of a greater scarcity of books than in St. Serf's. Often, only two or three breviaries and missals, a psalter, and a copy of the Gospels, were all the books owned by a religious house. The possession of an entire copy of the Scriptures (the Latin version of St. Jerome) gave immense importance to a monastery or church. Nor was this surprising, when the enormous labor of transcribing a Bible, letter by letter, is considered. Alcuin, a native of England, and one of the most industrious and ingenious monks of his time, occupied himself from about 778 to 800 A.D., a space of 22 years, in making a copy of the Bible for the emperor Charlemagne. This ancient and extremely interesting monument of piety and labor is now in the British Museum, which became possessed of it for the sum of £750. The museum is also enriched with a variety of missals and other works executed by the monks. In the present day, it is scarcely possible to form a correct idea of the value put upon books, even of a common order, or of the prodigious care which was taken of them, during the middle ages. To preserve them from embezzlement, they were in some cases chained to shelves and reading-desks; and in the dwellings of nobles, a volume might be seen chained to a table in the hall, for the use of such members of the family as were able to read.

The establishment of universities in the 12th c. greatly stimulated the manufacture of books by transcription, more particularly those classics and philosophical treatises that were required by students in the colleges. The anxiety of the authorities in these schools of learning to insure accuracy in the text-books, as well as to prevent the use of books of an improper kind, led to the establishment of censorships and privileges which interfered with the preparation of, and traffic in, books, long after the invention of printing. Unfortunately, while this art was superseding the ancient process of transcription, the convulsions consequent on the reformation caused an enormous destruction of books. In England, the libraries of monasteries, representing the labor of a thousand years, were mercilessly destroyed on the spot, or carried off and consumed in base purposes, without a thought as to their value. In Scotland, the monastic libraries which had escaped the ravages of Danish and other invaders, were similarly destroyed. The same fate overtook the ancient monastic libraries of France at the revolution. See LIBRARIES.

In consequence of these deplorable events, as well as the perishableness of books, copies of works prior to the invention of printing exist only as rare and valuable curiosities. Even of the early printed books, there are comparatively few copies extant. In England, books of improved typography and binding, adapted for ordinary libraries, date no further back than the reign of queen Anne. In proportion as literature has been popularized, books have diminished in bulk and costliness. In the 16th and 17th centuries, the ordinary sizes of books were folio and quarto; and as works of these huge dimensions embraced light as well as much ponderous literature, a popular poet uses no metaphor, when he observes that ladies "read the books they could not lift." The dignified quarto survived in imaginative literature even till our own times; for it was in this costly form that the early editions of the poetry of Scott, Byron, and others made their appearance. Excepting for special purposes, all such large sizes are happily superseded by octavos and still lesser-sized books. Forms and prices are no longer for the few, but for "the million." And copies of the Bible, instead of being chained to shelves and desks, and being valued at hundreds of pounds, are now scattered in myriads at the easy charge of a shilling.

The dimensions of printed books are regulated by the size and form of the sheets of paper of which they are composed. A sheet, being folded in the middle, forms two leaves, or four pages; and a book of this size is called a folio. When the sheet is again folded, so as to make four leaves, or eight pages, it forms a quarto. The quarto, being folded across, so as to make eight leaves, or sixteen pages, forms an octavo. By folding the sheet into twelve leaves, or twenty-four pages, we make a duodecimo; and if into eighteen leaves, or thirty-six pages, we form an octodecimo. Below this there are small books of different denominations, and which are sometimes spoken of as pocket editions. Booksellers are accustomed, in speech, to Anglicize the terms for the sizes of books, with little regard to the proper terminations—as 4to, 8vo, 12mo, 18mo, 24mo, 32mo, 48mo, etc. For a long period, printing-paper was made chiefly of three sizes, respectively called royal, demy, and crown; and according as any one of these was employed, the size of the book was large or small. Demy, however, was the most commonly used, and the demy 8vo may be said to have become the established form of standard editions of books. As by means of the paper-making machine, paper is made in webs, and can be cut into every imaginable size of sheet, and as printing-machines can print very large surfaces, the sizes of books are now comparatively arbitrary; though, for convenience, the old names remain, with the difference, that instead of the 12mo, a not very dissimilar size, called the post-8vo, has come extensively into use. The size of the present work is large royal 8vo.

A thin kind of book, consisting of a few sheets sewed or stitched together, without boards, is called a pamphlet—a term supposed to be derived from the French words *par filet*, "by a thread." The French term *brochure* (from *brocher*, to stitch), signifying pamphlet, is coming into use; as also the French word *livraison*, signifying a portion of a book (group of volumes) published separately. For an account of the modern traffic in books, we refer to the article BOOK-TRADE.

W.C.

BOOKBINDING, the art of connecting together in a durable and convenient manner the several parts of a book. The craft of the bookbinder is older than that of the printer. As noticed in the preceding article, the Romans had their *bibliopegi* for doing up their books in rolls; and during the middle ages, the binding of books in a square form was executed by certain orders of monks. As the first style of typography was an imitation of the penmanship employed in Bibles and Missals, so was the binding of the first printed books only a copy of what had been usual in doing up volumes of manuscript. But as printing greatly multiplied books, binding got out of the hands of the monks and other ingenious men who had hitherto carried it on, and assumed the character of a widely dispersed mechanical art, which, like other useful arts, has gone on improving till the present day. It says little for the taste or tact of the Germans, that they, the inventors of printing, should have long since been left behind, not alone as regards typography, but binding, and everything else connected with the preparation of books. The French have exerted their fine artistic taste in binding, and take the lead in this branch of art among continental nations. In the French language, the term *relieur*, used for bookbinder, has oddly enough the same root as *religion* (religo, to bind again). To the English belongs the merit of carrying the art to a high degree of perfection; for no bookbinding in the world excels that of London in solidity, elasticity, and elegance—the three great requisites of a well-bound book—which have been arrived at, not less from skill in manipulation, than the excellence of tools, and the prices which are ungrudgingly paid by wealthy book-fanciers. Reaching this advanced stage, bookbinding forms a regular craft, distinct from printing and bookselling, though in country towns it is sometimes united with these professions. Properly conducted, it is divided into the three departments of preparing, forwarding, and finishing; but in these there are many subdivisions of labor, a few of which may be referred to.

On coming from the press, sheets are first dried by being hung on poles for a length of time, and then smoothed by pressure, singly, between glazed mill-boards in a powerful hydraulic press. They are next collated or arranged in distinct books in quires, in which form they are delivered to the publisher. If, however, for immediate sale in "cloth boards," the sheets are transferred in masses from the printer to the binder, and treated as follows: The first operation is to fold the sheets, by means of a small instrument called a folder. The object is to fold down the different pages so as to fall on one another; and on the perfect accuracy with which this is performed depends the proper binding of the book. Though machines for folding have been invented, and for some kinds of work prove satisfactory, much of this operation is still performed by hand; usually the work is done by girls. After being folded, the sheets of the book are gathered and collated according to the "signatures," A, B, etc., which are printed at the bottom of the first page of each sheet. The books so made up and completed, are now pressed to a proper solidity, by being placed in quantities in a hydraulic press. The next process is to saw indentations in the back of the book, preparatory to sewing. If only a few volumes are to be sawed, the operation is executed with a tenon saw; when, however, there are large numbers, the books are placed on a machine with revolving saws, which instantaneously effect all the indentations. The books are next sewed on a frame, each sheet being attached by a thread to cords across the back. The sewing, though sometimes done by a machine, is chiefly executed by girls. On being removed from the sewing-frame, the book receives its "waste papers," which are pasted to the back on each side. The book is now "trimmed," by being cut on the edges by a knife-apparatus. In some instances, this is effected by the plough-machine on the screw lying bench; in others, the books are piled on a machine, beneath a broad knife, which descends like a guillotine, and a large number are cut with amazing expedition. The books are next glued on the back, to impart a certain degree of firmness. After this, they are "backed" by means of a machine, which imparts a certain roundness to the back, and at the same time gives a seat for the boards. The book, with a slip of canvas pasted on the back, is now ready for receiving the boards, which are previously cut in large quantities by a machine.

The preparing and attaching of the cover forms the final stage of the process. For the whole of the class of boarded books we have been describing, there is a method of making "cases." A case consists of cloth or paper pasted on two boards, the distance of the boards from each other being equal to the thickness of the book. The case being finished, receives the book, to which it is attached chiefly by pasting it to the canvas of the back and the blank or waste paper on each side. When the cases are in paper, they are at once applied in this manner, and the books may be said to be finished and ready for sale. Such is the mode of doing up that prodigious host of flashily covered volumes which forms a leading product of the cheap press. If the cases are in cloth, there are additional manipulations, in all of which machinery is employed.

Formerly, the ornamental and other work on the outside of books was executed in a tedious and expensive way by hand. Now, the operation, at least as regards cloth boards, is done by two or three impressions in a steam-wrought arming press; not more than half a minute being employed to do what in the olden time would have occupied a week. This improvement, the greatest in the art of book-binding, has been facilitated by an advance in the artistic skill of designers, by advancements in the art of die-sinking, and by corresponding adaptations of machinery—the whole united working towards an end.

When it is deemed necessary, for the sake of attractiveness, to stamp a peculiar device on the covers of a book, of which thousands are required, the design is referred to an artist, who, devoting himself to this branch of his profession, devises something appropriate and original. His design, drawn on paper, is cut in brass or steel; and this, in the form of a metal block, gives the stamp at a blow by the arming-press. When the design is to be gilt, leaf-gold is previously applied. The block being heated, gives a firm and clear impression. Such is the expeditious method of titling and ornamenting with blank and gold tooling the cloth-covered books that are now generally in use.

Books bound in leather, of course, go through a more slow and careful process of forwarding and finishing. Formerly, the folded sheets were beaten with a broad-faced hammer on a stone, but now they are squeezed between steel rollers, to give them the required solidity. The sewing, gluing of the back, backing singly with a hammer, and the other manipulations which follow, are all effected with great deliberation and nicety; and in this department of binding the highest class of operatives are employed. At one time, the titling of bound books was executed letter by letter, and comparatively few men had sufficient skill and steadiness of hand to produce good work. Now, lettering is sometimes done by means of metal types put together in a small case; though, when numbers are to be executed, the title is cut in block. It is usual also to apply stamps in block to the sides of bound books, and to leave only the finer and smaller tooling to be done by hand. Yet, although greatly assisted by new mechanical contrivances, the finisher must needs be a kind of artist. Coming to his hands flat and solid, and with its joints well formed, through the previous care of the forwarder, he delivers the book a perfect work of art. It opens easily, and lies flat out without any strain; its hinges are finely formed without crease; and on back, edges, and sides, the tooling claims mathematical precision.

A method of fixing together the leaves of a book by means of caoutchouc, or India rubber, instead of by sewing, has been invented. The sheets are cut into leaves, and the back edges, being laid evenly, receive a solution of this tenacious material. As each leaf is held merely by the caoutchouc which adheres to it, the book can be made to lie very flat; but this new kind of binding is only employed for maps, or books of plates, and does not seem likely to come into general use. Another novelty in binding is the substitution of wood for pasteboard boards, in imitation of books of ancient date. Applied only to some costly books of a fanciful kind, this must be considered to be but a passing caprice; for as wood is liable to warp, it can never serve so well as pasteboards.

In the present day, the binding-trade is pursued in various distinct branches. There are binders who devote themselves entirely to doing up books in cloth or paper; others execute general binding in leather; a third class bind only account-books; a fourth confine their workmanship to Bibles and prayer-books; and a fifth are known as binders of books in a high style of art. A common defect in provincial binding is a want of taste. Strength is given without elegance; even in the finest kind of books, there is often a vulgarity as regards the colors of the end papers, and the marbling of the edges, as if the binders were unconscious of proper delicacy of effect. The same thing may almost be said of the best American binding.

Among celebrated English binders of a past age, the foremost place is usually assigned to Roger Payne, a clever but wayward being who carried on business in the W. end of London about the year 1770, and who, from his unfortunate habits, died in great poverty. His reputation as a binder rests principally on his fine tooling and choice of ornaments, in which department he introduced many improvements. The greatest of Payne's successors was Charles Lewis, a London binder (1786–1836), whose talent, according to Dr. Dibdin, "consists in uniting the taste of Roger Payne with a freedom of forwarding and squareness of finishing peculiarly his own. His books appear to move on silken hinges; his joints are beautifully squared, and wrought upon with studded gold; and in his inside decorations he stands without a compeer." At present, there are several eminent binders in London, whose forwarding and finishing, as well as artistic decoration, have given them a deservedly high reputation. W. C.

BOOK-CLUB, or BOOK-SOCIETY, an association of individuals for purchasing and reading new books as they issue from the press, which, after being circulated among the members, are sold for the benefit of the concern. In some cases, the used books are disposed of by auction among the members. Book-clubs exist in many of the large towns and rural districts of Great Britain. Although new in name, and mostly composed of persons in the higher ranks of life, they are established on plans similar to the more humble class of reading societies which were common in different parts of the country in the latter part of the 18th century. In some places, the more fashionable book-clubs have been superseded by the late re-invigoration of the system of circulating libraries (q.v.). W. C.

BOOK-KEEPING is the method of recording business transactions in a set of blank-paper books kept for the purpose, by all classes of traders, as well as in various kinds of establishments. Viewed as an art, book-keeping was first brought to comparative perfection by the merchants of Genoa and other cities in the n. of Italy; and followed up by the merchants of the Netherlands, it has been brought to England, in which

country, as also in the British colonial possessions and the United States, it is now carried on in the best manner by professional accountants and skilled clerks in counting-houses. The books employed are usually of a folio size, strongly bound. For security against loss, it is customary to remove them every night from the desk and ordinary shelves in the counting-house to a fire-proof safe.

Although reduced to an accurate system, the details of book-keeping necessarily differ according to the extent and the nature of the transactions to be recorded. In all kinds of book-keeping, however, there are or ought to be certain pervading principles, to which we shall in a brief way refer. The object is to keep an account of the goods a trader buys and sells, and the money he receives and pays away; also to show, at short and periodic intervals, the exact state of his affairs—what are his *assets* (property and sums of money owing to him), and what are his *liabilities* (debts owing by him, and other pecuniary obligations). On the proper accomplishment of this object may be said to depend the stability and the reputation of the trader. Such is obviously the case, for, unless a person keep an accurate set of books to enable him to ascertain how his affairs stand, he must in a great measure be proceeding upon vague, and possibly erroneous conclusions; the result of which may be insolvency or bankruptcy, and loss of good name. In many instances, bankruptcy is traced to no other cause than the keeping of an insufficient set of books, and even keeping these badly. Viewed as credentials, a merchant's books are invested with a certain sacredness of character. Such a set of them is to be kept as will at all times admit of a satisfactory statement of affairs being made up. On this account, they require to be kept with great neatness, accuracy, and perspicuity. As a rule, there should be no blotting, no scraping out of words or figures, and no tearing out of leaves—the records are to be beyond suspicion of falsification.

Single Entry.—The simpler kind of accounting is called book-keeping by single entry; the principal books used being the day-book, invoice-book, cash-book, and bill-book, which are employed for recording the transactions as they occur, and a ledger, to which the entries are afterwards transferred, under the names of the parties concerned. The method is called single entry, for the reason that the items are entered only once in the accounts in the ledger.

Day-book.—The purpose of this book is to keep a daily account of all goods sold on credit—that is, goods not paid for at the time of being bought. The book is ruled with a date-line on the left-hand side of the page, and with double money-lines at the right-hand side. The entry of a transaction comprehends the name of the purchaser, and beneath it a note of the articles sold, with the prices extended to the first money-column. The gross amount added up is extended to the second money-column; so that the amount of all sales may easily be summed up. After the name of the purchaser, it is usual to put *Dr.*, and to articles in the entry is prefixed *To*—the meaning of these insertions being that the party named is *debtor* to the concern for the articles mentioned.

Invoice-book.—This book, which is similarly ruled, is sometimes called the *credit day-book*. It is used for keeping an account of all goods bought on credit. When the goods are bought, an invoice, or account of them, accompanies the package, or is received by post, and on being checked off, the items are copied into the book. After the name of the seller of the goods is inscribed the contraction *Cr.*, and to the items entered is prefixed the word *By*—the meaning of which is, that the party named is *creditor by* having sold the articles named. For the sake of brivity, some dealers merely enter the name of the creditor, the date, and the amount; and preserve the invoices, by docketing and tying them up in parcels, or by fastening them into a paper-book prepared for the purpose. In any case, the invoices should always be preserved.

Cash-book.—In this is kept an account of all cash received and paid, and of discount received and allowed. It is ruled for date and double money-columns on each page. Two pages, one opposite the other, are required for the entries; that on the left hand for entering cash received, and the discount allowed *by* the trader; that on the right hand for the cash he pays, and the discount allowed *to* him. The first money-column on each page is for the discount, and the second for the cash. For example, if a person settles his account, amounting to £5, less a discount of 5*s.*, the sum of 5*s.* is entered in the first column, and £4, 15*s.* in the second; by which means a record is kept of accounts settled and the money actually received. A similar explanation applies to the "cash paid" side. At the close of business for the day, the amounts on both sides are summed up and balanced.

Bill-book.—This contains an account of all "bills receivable"—that is, bills of which the trader is to receive payment; and "bills payable"—that is, bills which he has to pay. Sometimes, however, in the case of large concerns, these two classes of bills have each a distinct book. The books are ruled in a particular manner, to admit of an explicit statement of dates, amounts, length of term, and other particulars. See article Bills.

Ledger.—This is the great book of the concern. It comprehends an abstract of the entries in the day-book, invoice-book, cash-book, and bill-book, the whole collected in a methodic form under the names of the various persons, whether standing in the relation of debtors or creditors to the trader; and not only so, but an account of the trader's own private debit and credit. Two sets of colums are assigned to every person's account, one for *Dr.*, and the other for *Cr.* The copying of items from the day-book, etc., into these

ledger accounts, is termed posting. According to the ordinary practice, books are posted after short and regular intervals—not longer than a month. Having books at all times well-posted up is an acknowledged mark of a good man of business. By means of a well-posted ledger, and an inventory of stock and other assets, drawn up with a prudent regard to realizable value, the trader is able at the end of a year to make a *balance-sheet*, or condensed statement of his affairs. A proper balance-sheet ought to show the amount of capital invested in the form of money, stock, debts, etc.; also the amount of liabilities, the expenses at which the business has been conducted, the money drawn on private account, and the profit that is over, after all deductions have been made.

Some other books of a subsidiary kind are kept by large trading houses—as an *order-book*, in which copies of all orders are entered: a *memorandum-book;* an *account sales-book*, from which particulars are obtained for making out accounts of the sales of goods which may have been sent for disposal on commission; a *stock-book*, in which an inventory is kept of the stock on hand; an *account-book*, to contain a list of accounts; a *ware-house-book*, to contain an account of the quantities of goods; a *letter-book*, into which letters sent out by the firm are copied; with some others.

With such a set of books, and a few additional memoranda, a trader could doubtless strike a balance at the end of the year. He could see how much was owing to him, how much he was owing to others, how much he had spent, and how much would remain over, or how much would be deficient, after all accounts *pro* and *con* were settled. But by this elementary routine he could establish no satisfactory check on different departments of his business; and for large and complicated concerns, the system, if not absolutely valueless, would prove exceedingly imperfect. What the wholesale trader wants is a process of checks—one book checking another—the whole thing reduced to such a rigorously methodized system of entries that every fraction is thoroughly accounted for. No doubt, to effect this elaborate and minute system of B., a considerable expense is incurred for clerks; but in large establishments this is of small account in comparison with the advantages that are secured.

Double Entry.—The method of B., which has been so called, is only an extension of that already noticed. The distinct peculiarity in double entry chiefly concerns the ledger. Its object is a system of checks, to be effected by entering transactions in the ledger twice—first to the *debtor* of one set of accounts, and then to the *creditor* of another set. In making the two entries, one is posted to an account under the name of the debtor or creditor, and the other is posted to an account under the head of the goods that have been bought or sold. Take, for instance, the article sugar. Say the trader purchases a hogshead of the article from A. Brown & Co. He first enters it in the regular way to the *Cr.* of A. Brown & Co., and then turning to the folio headed "sugar," he enters it on the *Dr.* side of the account as bought from A. Brown & Co. In the same way, when the hogshead is sold to E. Fraser & Co., it is entered first to the *Dr.* of these parties, and then to the *Cr.* side of sugar as sold to E. Fraser & Co. By this system of double entries, one the counterpart of the other, the one set of accounts constantly checks the other set; a trader can also ascertain how, when, and at what prices his property has been disposed of.

In double entry, a book called a *journal* is frequently used. The entries in the day-book, etc., are abstracted into the journal, and thence posted in a brief form into the ledger; the use of the journal, therefore, is only to save the ledger from being burdened with details.

Acknowledged to be the triumph of accountantship, B. by double entry, or by the Italian method, as it is sometimes called, is not an entire safeguard against frauds and fallacies in the conducting of commercial operations, which, independently of every technical aid, requires to be sustained by constant integrity, vigilance, and discretion. Among the fallacies in the method of keeping books which are observed to sap the stability of the most gigantic concerns, are two so conspicuous as to demand our notice. The first consists in including bad or nearly worthless debts in the periodical lists of assets. The second is that of not estimating stock at its realizable value only. This last may be said to be a common error among traders, many of whom, without any evil intention, and simply from want of prudent consideration in making due allowance for depreciation of property, delusively and gradually slip into a condition of hopeless insolvency.

B. forms a department of school education in connection with penmanship and arithmetic. There are various useful treatises on the subject, with forms for day-book, ledger and other books. Among the larger and more comprehensive of this class of works are *A Complete System of Book-keeping*, by Benjamin Booth (Lond. 4to), Jones' *Science of Book-keeping Exemplified* (Lond. 4to); *Practical Book-keeping*, by F. H. Carter, (Edin.). Among the lesser and more accessible treatises we may specify *Book-keeping by Single and Double Entry*, by W. Inglis (Edin.). It is proper, however, to add, that no method of school instruction can supercede the practieal knowledge which is to be procured only in a busy and well-conducted counting-house. W. C.

BOOK-STALLS. See Book-trade.

BOOK-TRADE, the business of dealing in books, in which are comprehended two classes of persons—publishers, who prepare and dispose of books wholesale; and book-

sellers, to whom the retailing of books more properly belongs. Although ordinarily distinct, the two professions may conveniently be treated together. While publishing, apart from bookselling, is of modern date, the selling of books is as old as the origin of literature. Copies of the works of authors in manuscript were sold in the cities of ancient Greece and Rome. Horace celebrates "the brothers Sosii" as eminent booksellers (*bibliopolæ*). With the foundation of several universities in the 12th c., the preparation and sale of books increased; but the trade of bookselling attained to importance only after the invention of printing. The first printers acted also as booksellers, and being mostly learned men, they were generally the editors, and, in some instances, the authors of the works which they produced. See PRINTING. Faust and Schæffer, the partners of Gutenberg (q.v.), carried the productions of the Mainz press to the fair of Frankfurt-on-the-Maine and to Paris. Some instances of division of the two branches, printing and bookselling, occurred in the 15th century. John Rynmann of Augsburg (1497–1522) styled himself, at the conclusion of his publications, "Archibibliopola of Germany." In consequence of the Reformation, the seats of learning were gradually removed from the southern to the northern states of Germany, and, of course, the booksellers followed their customers.

Migrating from place to place, and also resorting to the great continental fairs for customers, the early booksellers became known as *stationarii*, or stationers, from the practice of stationing themselves at stalls or booths in the streets, as is still customary with dealers in old books. The term stationer was long held to be synonymous with bookseller, but in modern times it is more commonly applied to dealers in paper and other writing materials.

Whether settled or migratory, the early publishers and sellers of books were subject to a number of restrictions, as is still the case in France and Russia. In England, the book-trade was trammeled by royal patents and proclamations, decrees and ordinances of the star chamber, licenses of universities, and charters granting monopolies in the sale of particular classes of works. In 1556, in the reign of Mary, the stationers' company of London was constituted by royal charter, the professed aim being the "removal of great and detestable heresies." The members of the company were made literary constables to search for books, etc., and it was ordered "that no man should exercise the mystery of printing, unless he was of the stationers' company, or had a license." The charter, which was confirmed by Elizabeth in 1559–60, in effect empowered the company to make ordinances as to the printing and sale of books, and to exercise an arbitrary censorship of the press. The Crown, by an act 13 and 14 Car. II. c. 23, commonly called the "licensing act," assumed this species of control over the issue of books. The licensing act, and its renewals, ultimately expired in 1694. By the first copyright act, 8 Anne, c. 19, the legislature interposed to protect the rights of authors, and to relieve them, as well as publishers, from the thraldom of the stationers' company. But, by the same act, the archbishop of Canterbury, the lord chancellor, and certain judges in England, and the judges of the court of session in Scotland, were empowered, on the complaint of any person, to regulate the prices of books, and to fine those who sought higher prices than they enjoined. This provision was in force till 1738, when it was abolished by the act 12 Geo. II. c. 36. From this time the book-trade was free. How it spread and flourished may be best learned from the history of the literature with which it is identified. Subsequent to the reigns of Anne and George I., there was a succession of men of literary repute connected with the metropolitan book-trade; among whom may be mentioned Cave, the conductor and publisher of the *Gentleman's Magazine*, and early patron of Samuel Johnson; Dodsley, a poet and dramatist, who reached the head of the bookselling profession; and three generations of the Nicholses. We might also include Richardson the novelist, a printer, who, in 1754, became master of the stationers' company. The names of Baldwin, Rivington, Longman, Tonson, Miller, Cadell, Dilley, Lackington, and others, will also be as familiar as are the Knights, Bohns, and Murrays of later times.

Now, as formerly, the book-trade is centered in London, though carried on to a considerable extent in Edinburgh, and in a less degree in Oxford, Cambridge, Dublin, Glasgow, and a few other places. There are various reasons for London being the metropolis of English literature. As a center of wealth, taste, and intellect, authors flock towards it as an agreeable and permanent home, and find in the library of the British museum the most ample materials for reference and study. By means of its system of railways, and its port, assorted parcels of books can be conveniently despatched to all parts of the United Kingdom, and of the world. It has numerous wholesale stationers, and abounds in printers, bookbinders, artists, and wood-engravers. Stationers' hall, in which the rights to literary property may be inscribed, is situated in London. Through its channels of literary intelligence and criticism, it possesses the most ample means of making new works known. Through favor of these circumstances, the metropolis becomes the center of the British book-trade; almost every new work floats towards it, either for publication or to be issued wholesale on commission. In 1878, there were connected with the book-trade, within the bounds of the post-office district, 296 booksellers who were also publishers, and 446 booksellers alone. Of these, about 18 confined their business almost exclusively to the sale of foreign books, and 15 to the publication and sale of law-books. Among the booksellers are included com-

mission-houses; and among the publishing establishments are several branches from Edinburgh and other places. The London book-trade is partly carried on in distinct departments; miscellaneous literature, law books, medical books, educational treatises, periodicals, etc., respectively engage the attention of publishers; and as regards religious books, each sect may be said to have publishers and booksellers of its own. The greater number of the publishing and commission houses are situated in Paternoster row and the courts adjoining; so that this part of the city has become the great and acknowledged market for literature. In whatever part of the metropolis books are primarily issued, they may be found in one of the establishments in or about "the Row," by which means the collecting of books to meet country or foreign orders is effected at once on the spot. Every commission-house has "collectors," who, with bags, are seen hurrying about, picking up the works which are entered in their collecting-book. When not so found, books are said to be "out of print."

In Scotland, after struggling through an age of similar restrictions, the book-trade was developed about the middle of the 18th century. In Edinburgh, it was followed by Allan Ramsay, who published and sold his own songs, and his still more charming pastoral. Among his successors were Donaldson, Bell, Elliot, and Creech, each eminent in his way; more lately, the trade was ably sustained by Archibald Constable, the first publisher of the *Edinburgh Review* and *Waverley Novels;* and by William Blackwood, the originator of *Blackwood's Magazine;* still more recently the reputation of the Edinburgh book-trade was maintained by the late Adam Black, publisher of the *Encyclopædia Britannica*, and who, besides rising to the highest civic honors, became member of parliament for his native city, on the retirement of Mr. (afterwards lord) Macaulay (1855).

Considering the many advantages possessed by London, it may appear surprising that the business of publishing should be attempted to any extent in Edinburgh—the only place out of the metropolis to which we need specially refer. Yet, the Scottish capital is not devoid of recommendations. Its general society is of a character to invite the residence of men of literary acquirements, and it is fortunate in possessing an extensive collection of books for reference in the library of the Faculty of Advocates. Edinburgh publishers are able to conduct their enterprises with a degree of calmness and deliberation which can scarcely be realized in London; while, at the same time, they enjoy a certain advantage in comparatively cheap labor. Paper also may be obtained at a somewhat lower price from Scotch makers than from the wholesale stationers of London—this last circumstance being of first importance in producing large impressions of cheap books and periodicals. As Edinburgh books are mostly sent to London, the expense of carriage and loss by commission form a drawback on profits. Notwithstanding this and other disadvantages, the book-trade of Edinburgh continues in a thriving condition. It comprehends upwards of 30 firms carrying on the united business of publishers and booksellers, and 90 who carry on business as booksellers alone. In this list are several leading publishing houses, which print the works that they issue, an economical and convenient union of professions which forms a peculiar feature of the Edinburgh book trade. In the establishment whence the present work is issued, every department connected with the preparation and dispersion of books is included.

The publishers and booksellers of the United Kingdom possess no corporate privileges, nor do they associate for any professional object. No premiums are offered to stimulate improvements in typography, binding, or anything else—the trade being entirely free, members being left to rise through individual exertion. All members of the profession, however, constitute, what is, *par excellence* "the trade," through which there is a pervading and strong feeling of fellowship.

In the infancy of the trade, authors frequently resorted to the plan of getting friends and patrons to subscribe for copies of their forthcoming works; the publisher in such cases acting only as commission-agent. Dryden's translation of Virgil's *Æneid* was sold in this way. There were, in the case of that work, two classes of subscribers, one paying five, the other two, guineas for a copy. Those who paid the larger sum obtained the additional value, by individually receiving a dedication plate with their arms underneath. There were 101 of the first class of subscribers, and 250 of the second. Pope made a fortune by his *subscription* books. He realized upwards of £5000 from his translation of Homer's *Iliad*, and £3000 from that of the *Odyssey*, both sold by subscription. Johnson, who lived in the transition state between the old and new way of disposing of literary works, perceived that the subscription system was essentially an unsound one, and that booksellers formed a proper and necessary medium between authors and the public. "He that asks for subscriptions soon finds that he has enemies. All who do not encourage him defame him." And again: "Now learning is a trade; a man goes to a bookseller and gets what he can. We have done with patronage." Literature has now risen above this degrading system. At present, (1) the author sells his work in manuscript to the publisher for a specified sum, giving him an assignment of the copyright, and leaving him to bring out the work according to his own fancy; or (2) the author retains the copyright, pays all expenses, undertakes all risks, and gets a publisher to bring out his work; or (3) the author, retaining the copyright, incurs no risk, and only allows the publisher to print and issue an edition of a certain number of copies for a sum agreed on; or (4) the author and publisher issue the work at their joint risk, and on such other terms as are mutually agreeable. In some instances, the publisher will not

undertake to issue a work, unless the author gets it printed, and delivers copies ready for sale; in others, he will relieve the author of this trouble, and risking outlay, keep an account of charges and sales. Any plan by which an author retains a risk, is seldom satisfactory. Publishing is an exceedingly hazardous profession. Works of which the highest expectations are formed, may not pay expenses; and books of a very frivolous and seemingly worthless kind may prove exceedingly remunerative. From a general misapprehension on this point, publishers have frequently been maligned as unjustly living on the brains of authors, who are ever represented as an unfortunate and ill-used race. A knowledge of the hazardous nature of publishing, and of the heavy expenditure ordinarily incurred for making new books known, not to speak of the unreasonable expectations which are sometimes formed by literary men, would do much to dispel the common notions on the subject. For one book that is highly successful, there are numbers that become a dead stock in the warehouse, and barely pay expenses, of which melancholy fact too many authors who undertake the expenses and the risks of publication must be well aware, from dear-bought experience. But with writers of really popular and successful works, English publishers usually deal in a most liberal spirit; numerous instances, indeed, could be cited in which they have voluntarily and largely added to the remuneration stipulated to be given for copyright. For the celebrated sermon, *Religion in Common Life*, preached before the queen by the Rev. John Caird (1855), though only a shilling pamphlet, the publishers, Messrs. Blackwood, of Edinburgh, gave £100; but the sale having gone far beyond expectations, they afterwards, of their own accord, presented the author with an additional sum of £400. Facts like this, while reflecting honor on the book-trade, show the baselessness of the imputations so inconsiderately cast on publishers as a body.

In publishing new books, the following are the items of outlay which need to be taken into account: Copyright, paper, setting up the types, author's corrections, stereotyping, press-work or printing, embellishments, binding, advertising, presentation copies to editors for review, and to public institutions in terms of the copyright act. When the author retains the copyright, the publisher charges, besides the above items for printing, etc., a commission on the sales of the work. New books are issued at a certain selling price to the public, and the publisher allows a percentage off the price to the retail bookseller. In a large proportion of cases, there is interposed the commission-agent. Several London publishers have commission-agents in the principal towns, to whom they consign quantities of each work to be sold to the retail dealers; and in the same way, provincial publishers having agents in London, it happens that the book-trade is largely and necessarily carried on through middlemen. These individuals, of course, receive a commission adequate to remunerate them, after giving the ordinary publisher's allowance to the retailer.

It is usual, on issuing new books, for publishers or their agents to send out the work to be "subscribed" among the trade. A copy of the new work is shown by way of sample, and the subscription paper bears the selling price, and the price at which copies are offered. Besides making the trade acquainted with the day of publication of works which have been some time expected, this practice offers an opportunity for speculating. As an encouragement to do so, the work is offered at a somewhat lower rate than is afterwards allowed. By subscribing for books in this manner, and also by means of "trade sales," commission houses in the Row ordinarily put themselves in possession of the works issued by publishers in other parts of London.

Trade sales, which are now less common than formerly, are conducted in the following manner. A publisher, wishing to dispose of his stock, issues a catalogue to the trade, stating the reduced price of each book, as well as the length of credit offered; and that the sale is to take place in a tavern specified, on a certain day for which an invitation is given. At the appointed time and place, a handsome dinner is on the table, and perhaps from eighty to one hundred and fifty guests are assembled. Nothing is said about business during dinner, but with the wine and glasses afterwards, and amidst no little good-humor, the sale begins. Each book being called over, every person has an opportunity of saying how many copies he will take. Occasionally, a toast is proposed, in order to maintain the hilarity of the meeting.

At these sales, it is not unusual to dispose of "remainders of books," that is, fag-ends of editions which are not moving off with sufficient alacrity in the ordinary course of trade. Remainders are either offered in small quantities at a very reduced price, or they are sold in the lump by auction. Purchased cheaply, these remainders are henceforth known as "books with broken prices." Many of the new-looking books ticketed at cheap booksellers are portions of these remainders. In some instances they are sent to the colonies, in the hope of finding a market. At these trade sales it is common to do business to the extent of from £5000 to £10,000; in the case of one publishing house, the amount is usually, at a half-yearly sale, from £12,000 to £15,000; and in another, being an annual sale, it is seldom less than £26,000. To avoid the seemingly useless outlay on a dinner, some publishers rely on the circulation of "sale catalogues," comprising offers at tempting prices, provided that orders are given within a certain day. Vast quantities of school-books of good reputation, and other works permanently in demand, are bought by London commission-houses in this manner annually.

Throughout the more respectable part of the trade, there is a constant effort to main-

tain unbroken prices; but when a book can be obtained by booksellers below trade-price, it is essentially ruined for all regular business. On the other hand, there has sprung up a practice amongst some retail booksellers of selling new books to the public at prices little above cost. This system of underselling has caused much disquietude in the trade. For a long time, resolute attempts were made by the heads of the profession to refuse to deal with undersellers; but these, appealing to the public, ultimately conquered; and now books of all kinds are disposed of at such prices as the bookseller pleases. In one sense, this underselling is unjust to the publisher, who has his wares sold cheap, without the *éclat* and solid benefit which he might derive from fixing on them such low prices as would induce a large sale. Whether publishers will in time fall on the expedient of lowering nominal selling-prices, at the same time lessening allowances, or whether they will altogether drop the marking of prices, are questions on which we need not enter. Enough has been said to show that, after making all ordinary deductions, to which losses, etc., may be added, publishers can reckon on receiving little more than half the price at which their books are nominally issued. To limit impressions as nearly as possible to the demand, is always a matter of serious consideration to the publisher; for, unlike most other kinds of goods left on hand, the overplus stocks of books are often nearly valueless. On this account, books are seldom sent out on sale or return except to commission-agents.

In one important respect the English publisher differs from the producer of almost every other class of goods. He has not only to manufacture the article, but to make it known to the public. While the retail draper takes upon himself the trouble and cost of advertising his novelties in order to attract customers, the retail bookseller is relieved from any such obligation, and has little else to do than to hand across the counter the book for which a demand has been stimulated by the costly efforts of the publisher. The grand difficulty with the publisher is to excite general attention to his wares. Hence, the stupendous advertising system in newspapers and other channels of intelligence Some publishers are reported to spend as much as £5000 per annum on advertisements, and an expenditure of from £1000 to £2000 is quite common. The monthly and quarterly periodicals being important advertising channels, it is of consequence to publishers to possess one of these, both for the sake of the revenue it may produce, and for keeping their own books before the public. A well-circulated periodical, therefore, is to be viewed as almost a necessity in the business of the publisher—the thing which gives spring and vitality to what might be otherwise an inert and difficult concern. So grave a matter is advertising to the publisher, that it is very generally the practice to employ one or more clerks to write, arrange, and distribute advertisements, and to conduct the multifarious correspondence connected with them. In consequence of these burdensome outlays, and other causes, including the liberal distribution of copies of books for review, the prices affixed to original works are necessarily higher than the actual amount of paper and print would seem to warrant. Books, as has been said, are subscribed for among the booksellers of the principal cities; but booksellers in the country towns either send for supplies by letter, or give their orders to travelers employed by the chief houses. Between the country booksellers and the leading publishers in London, Edinburgh, or Dublin, there is kept up a continual correspondence. In addition to his daily or weekly parcel, every provincial bookseller makes up a monthly order for magazines, periodicals, and books; and the collecting for monthly parcels forms one of the remarkable phenomena of the Row. The day of making up, called "magazine day," is the last, or last but one, of the month, when periodicals for the succeeding month are collected and dispatched. In receiving and forwarding of inclosures by these monthly parcels, there prevails a spirit of mutual accommodation, which is exceedingly commendable, and without which, indeed, a large portion of the book-trade would be at a stand. By means of inclosures, booksellers in the most distant parts of the country are able to procure small supplies from different publishers at a trifling charge for carriage—with what result of convenience to the public need not be dwelt upon. The execution of foreign orders, is, of course, comprehended in the business of the publisher. Publishers formerly took but little account of the demand likely to arise for their books from abroad, but now they frequently print an extra number of copies for export to the United States, Canada, and Australia. Previous to the internecine war in the United States, American publishers were in the constant habit of seizing upon popular English copyright books, and reprinting them in a cheap form suitable for their own market, which included Canada and several other British colonies. As nothing was paid to the author, books so printed were sold at prices against which the English publisher found it impossible to compete; he therefore withdrew in disgust, and left the colonnial market to be supplied with "pirated editions." The protective system in vogue in the United States largely assists in maintaining the high cost of production in America, of books as well as other things. This, in connection with the greater literary fecundity of the old country, enables a large export trade in books to be done with the Americans. The Canada copyright act, too (38 and 39 Vict., c. 88), provides for the republishing or reprinting of English books in Canada; so that, notwithstanding the absence of any international copyright treaty, it is probable that in the course of a few years most modern English books read in any part of America will be such as are either printed here, or are reprinted there by arrangement with the English publisher or author.

The plan of issuing neat cheap editions of popular works, was struck out a hundred years ago (1760–70) by Alexander Donaldson, an Edinburgh bookseller above referred to,* and was followed up by several publishers in London, one of whom, C. Cooke, of Paternoster row (1790–1800), issued an extensive series of cheap reprints, of a pocket size, called *Cooke's Editions*, which for tastefulness of preparation have never been excelled. In the early years of the present century, Suttaby's, Sharpe's, Walker's, and Dove's pocket editions, were stock articles in the trade. About 1817–18 some enterprising booksellers began to break through certain old usages of the trade, by issuing reprints of standard works, in a good style of typography, at considerably reduced prices. At the same time, numerous cheap periodicals made their appearance; but these, for the most part, were of so seditious, irreligious, and libellous a character, that the law interposed to check the growing evil, by the act 60 Geo. III., and 1 Geo. IV. c. 9. See NEWSPAPERS. Those cheap unstamped periodicals which appeared during the next ten years, were only tolerated when, eschewing news and politics, they confined themselves strictly to matters of instruction or amusement. The only one that attained to permanent success was the *Mirror*, an illustrated weekly sheet, 8vo size, projected by John Limbird in London, the first number of which appeared Nov. 22, 1822. When, therefore, in 1827, the society for Diffusing Useful Knowledge began to issue its low-priced scientific treatises—and when, in the same year, Archibald Constable commenced the cheap series of works in original literature, called *Constable's Miscellany*—the public were already in some measure familiar with a certain class of cheap books. Yet, viewing all previous enterprises of this kind as fitful and insufficient, as well as unsupported by any breadth of appreciation, we have to refer to this period (1827–32) for the true origin of what is now designated the "cheap press." Constable's attempt to cheapen literature was happily coincident with a general awakening in the public mind, and proved eminently successful; imitations followed; a variety of serial works, in small volumes, for popular use made their appearance. A similar popularizing of the price of periodicals was the next step in advance. Several cheap sheets of an entertaining nature were issued, similar to Limbird's *Mirror*, though more resembling a newspaper in shape, but for various reasons most of them soon disappeared. At this juncture, taking advantage of the growing demand for cheap literature, and desirous of guiding it in a right direction, William and Robert Chambers, of Edinburgh, began, on the 4th of Feb., 1832, to issue *Chambers' Edinburgh Journal*, a weekly sheet at 1½*d.*; on the 31st of Mar. following appeared in London the *Penny Magazine* of the society for the Diffusion of Useful Knowledge; and July 7th, this was followed by the *Saturday Magazine*, which was issued under the direction of a committee of the society for Promoting Christian Knowledge. So many cheap publications of various kinds followed, that it would be impossible to particularize them in this brief sketch. The efforts to establish a cheap press were much facilitated by two great inventions—the paper making machine and the printing-machine, both of which had been introduced within the preceding twenty years. The continued issue of cheap reprints of popular works out of copyright has greatly changed the aspect of the trade; and although works at old prices are as numerous as ever, cheap books of an improving tendency are now placed within general reach. By the enterprise of certain publishers, new and copyright works are also now issued in a cheap form, in boards, with colored paper covers—the prices of these neat and handy volumes being from 1*s.* to 2*s.* 6*d.* each. The trade in this class of books, and in cheap periodicals and newspapers, has been largely developed by railways. On the platforms

* According to the act, 8 Anne, c. 19, the copyright of a book was for 14 years, with a second term of 14 years contingent on the author being alive at the expiration of the first term. While such was the law, publishers who bought a copyright were usually allowed, by courtesy of the trade, to continue to publish their works unmolested during the second term, even if the author was dead when the first term expired. Notwithstanding this act there was long so little precision as to questions of literary property, that works issued by London publishers were freely reprinted in Edinburgh, while those belonging to Edinburgh publishers were similarly dealt with in London—for example, *Ramsay's Poems*, which were issued by the author at Edinburgh in 1725, were reprinted in London, and also in Dublin, in 1731. Alexander Donaldson, of Edinburgh, is said to have taken the lead in this kind of trade, though from any evidence on the subject, it does not appear that he went beyond the bounds of the law. In order to extend his sale of cheap reprints, he opened a shop in the Strand: a step which brought him into collision with certain publishers in London. It will be recollected that Boswell, in his Life of Johnson, under date 1763, alludes to this case of Donaldson, who is spoken of by Johnson as "a fellow who takes advantage of the state of the law to injure his brethren"—one who, supposing he did reduce the price of books, "is no better than Robin Hood, who robbed the rich in order to give to the poor." To judge from the litigation which ensued, Donaldson scarcely merited these strictures. In 1771, certain parties in London procured an injunction from the court of chancery to restrain Alexander Donaldson from printing and selling *Thomson's Seasons*, on the ground that it was their property. Donaldson, appealing to the house of lords, showed that the work in question was first printed in 1729, that its author died in 1748, and that the copyright expired in 1757. The lords decided in favor of Donaldson; thereby settling the point, that copyright depended entirely on the statute, and was not an inherent and interminable right of property, as many seem to have believed it to have been. Some details of this curious and important case will be found in the article COPYRIGHT. Donaldson, whose enterprises are spoken of approvingly by Boswell, left a fortune, which was greatly augmented by his son, a newspaper publisher in Edinburgh; and the total sum, amounting to nearly a quarter of a million sterling, was bequeathed to found an educational hospital for poor children. This building adorns the environs of Edinburgh, and is one of the most magnificent in Scotland. See DONALDSON'S HOSPITAL. This is not the only hospital for which the world is indebted to the book-trade. Thomas Guy, a bookseller in Cornhill, London, founded during his life the hospital which bears his name; he died in 1724. See GUY'S HOSPITAL.

of all the chief termini and stations, there are stalls for the sale of books, periodicals, and newspapers. These stalls, consisting of a counter and some shelving, which can be closed in with shutters at night, are rented from the railway companies by different booksellers, from whose head establishments supplies ceaselessly radiate. One firm, in Aug., 1878, had 645 stalls. A London publisher was recently able to announce that in the twelve months preceding he had printed five millions of book.

The sudden and successful rise of a cheap press was not viewed with complacency by the fathers of the trade, and for a long time it was believed that, like many other novelties, it would have its day, and disappear. Looked at, therefore, as temporary and undignified, the cheap press was left to force its way in the hands of two or three ardent young publishers, who, extending their operations, at length assumed a position which could not fail to command respect, and to excite a spirit of emulation. Latterly, the old established firms have begun, though in a hesitating way, to issue a cheap class of publications, by reprinting and otherwise. At the same time, these firms, besides generally maintaining the old prices, unite to keep a few editions of standard works in print. These "trade editions," as they are termed, are printed and supplied in shares; each party concerned taking an interest in their sale, and being so far precluded from attempting the issue of rival editions. The names of all the proprietors of these joint-stock books are printed on the title-page; but as no new books are added, this once popular method of publication will soon become extinct.

As circulating libraries, by creating a taste for reading, led to the establishment of the cheap press, so, as might be expected, has the cheap press extended the sphere of literature, and given rise to public libraries and book-clubs; and even circulating libraries, which for a time suffered from the deluge of minor publications, have begun not only to revive, but to assume dimensions beyond precedent. Mr. Mudie, in the year 1842, introduced a new system of subscription lending library, which in 1873 contained a million volumes, employing 80 clerks, and having no fewer than 18,000 subscribers to the London establishment alone. As many as 2000 copies of a single work at 18s. or a guinea are sometimes added; so that in many cases what would formerly have been considered to be large editions are absorbed by one purchaser. After being used for several months, the overplus copies belonging to these libraries are disposed of at from a half to one quarter of the original price; and the readiness with which they find customers among the lesser libraries throughout the country is alone an evidence of the increasing demand for books. Mudie's library now contains more than 2,000,000 volumes, having absorbed the largest of the older circulating libraries, which was said to contain half a million volumes.

The selling of second-hand books from open stalls, and from booths (q.v.), is a practice so ancient as to be connected with the trade of the stationarii of the middle ages. Some men of considerable note in the book-trade began in the humble quality of stall-keepers. The most celebrated instance of this kind is perhaps that of James Lackington. He commenced his remarkable career by keeping a small stall of old books, which, while working as a shoe-maker, he placed at his door in one of the obscure streets of the metropolis; and from his ultimate success, was able to inscribe the proud boast, *Sutor ultra crepidam feliciter ausus*, on his very entertaining memoirs. Though more common formerly than now, book-stalls are still seen in every large European city. They particularly abound in Paris—chiefly on the quays near the Pont Neuf; and at all the great continental fairs, stalls of new and second-hand books are conspicuous. Book-sellers at one time took their place among the stall-keepers on market-days in English provincial towns, nor have they altogether disappeared. Michael Johnson, book-seller in Lichfield, was in the habit of setting up a stall for the sale of his wares, every market-day, in Uttoxeter. On one occasion, confined to bed by indisposition, he requested his son Samuel to visit the market, and attend the stall in his place, which he refused to do. How this act of criminal pride and filial disobedience preyed in after-years on the mind of the great lexicographer; and how, in his old age, to expiate this juvenile delinquency, he went to Uttoxeter on a market-day, and stood on the site of his father's stall for the space of an hour bare-headed in the rain, exposed to the jeers of the by-standers, are among the most characteristic circumstances narrated in the life of this extraordinary man (see Boswell, Crocker's post 8vo edition, vol. x., p. 103). The flood of cheap publications 40 years ago, which has been already referred to, greatly damaged the stall-trade in old books. Nevertheless, there remained in London a few book-stalls and booths, and in Edinburgh, though fallen from their high estate, book-stalls are still visible. In Paris the stall-trade still flourishes, and no book-hunter in that city loses the opportunity of a ramble along the quays. It must be admitted, however, that the business is losing its picturesque character; it is getting into a regular shop-trade, and attaining to dimensions far beyond the notions of the old class of stall-keepers. London, of course, is the chief seat of the second-hand book-trade; but it is also conducted on a respectable scale in Edinburgh, Glasgow, Manchester, Liverpool, Oxford, Cambridge, Dublin, Bristol, and some other centers of wealth and intelligence. The dealers procure supplies chiefly at public auctions of the libraries of deceased clergymen, professors, and private gentlemen, of which sales there is a constant succession in London, Edinburgh, and elsewhere. At these auctions, good editions of standard books may usually be obtained at moderate prices; but rare and curious works, prized by the "bibliomaniac," frequently

bring very high sums. See BIBLIOMANIA. Dealers in second-hand books send catalogues to their customers throughout the country; and from this source not a few gentlemen's libraries are mainly made up. During the past 20 years, there has been a growing scarcity of second-hand high-class works, in consequence of the purchase of large quantities for public libraries forming in the United States. From France, Italy, and Germany, there has been a similar export-trade in splendid old editions to North America.

At one period, it was usual to limit editions to from 500 to 1000 or 1250 copies, and impressions of 2000 were considered excessive. Now, large editions are more frequently the rule than the exception, particularly as regards the works of standard authors published in a cheap form. As the cost of composition (setting the types) is the same for a large as for a small edition, and as the charge for press-work is only a little more for a larger than a smaller impression, the profit on a book rises rapidly in proportion as the quantity put to press increases. In the case of cheap books, it is absolutely necessary that large impressions be sold, in order that they may realize any profit to the publisher. In preparing this class of books, therefore, to the extent of from 20,000 to 50,000 impressions, the element of composition dwindles into insignificance. The chief things taken into account are paper, machine-printing, and boarding. Paper, however, being the matter of most serious concern, the weight is rigorously computed beforehand by putting a sample volume into the scales. To avoid delay, and also to save outlay in preparing future impressions, it is customary to stereotype cheap books and periodicals. Although, like composition, stereotyping forms a minor charge, the accumulation of stereotype-plates at length becomes considerable, and, as in the case of overplus stock, forms a burden on the capital of the publisher.

The changes produced in the English book-trade by the cheap press are not more remarkable than that improvement in taste which has subdued the traffic in books of a politically objectionable, and of a demoralizing character. Contrary to fears entertained on the subject, the cheapening of books, periodicals, and newspapers has in no perceptible degree deteriorated literature. The sale of books of a grossly demoralizing tendency has been driven into obscurity, and in other ways circumscribed by an act of parliament (21 and 22 Vict., c. 83); and it is demonstrable, as regards periodicals, that those of an objectionable kind form but a small proportion—not one hundredth part of the whole. Little dependence can be placed upon the statements given of the circulation of weekly and monthly magazines, as there is a general disinclination on the part of respectable publishers to state their actual sales; while the numbers mentioned by the less reputable members of the trade are almost without exception fictitious, and are generally mentioned for the sole purpose of attracting advertisements. Cases have been brought before our notice in which hundreds have been magnified into thousands, and in very rare instances indeed is the *bona-fide* circulation honestly stated. The aggregate monthly circulation of periodicals of all descriptions, excluding newspapers, may be stated at about 10,000,000, of which not more than 90,000 are actually immoral or anti-religious. The circulation of some of the religious magazines is very large; of two published at sixpence monthly by the religious tract society, one sells to the extent of 160,000, and the other 85,000. Including newspapers, the total number of separate weekly and monthly publications issued in London is nearly 800.

Obviously, the sale of such an enormous mass of cheap sheets would be overwhelming to the ordinary trade; in point of fact, the writing and publishing, and also the retailing, of the more widely circulated penny papers are conducted as a separate business. The sales are effected chiefly by means of small shops in back-streets, the purchasers being, besides domestic servants, all varieties of persons, old and young, who reside in these humble localities. The rise of these cheap periodical and newspaper shops, in adaptation to new social wants, is not the least remarkable of the "signs of the times." Nor can it be spoken of with regret. With other commodities the huxter dispenses the weekly pennyworth of literary amusement, which, enjoyed in the poorest family circle, enlivens the most dreary fate, and if not directly elevating in its tendency, may be presumed to do at least some good as a substitute for more exceptionable means of excitement. On general grounds there is cause for congratulation. Considering the preponderatingly large proportion of cheap periodicals of an unobjectionable, and not uninstructive kind, and looking also at the perfect freedom now enjoyed by every department of the press, we have a striking illustration of the vastly improved state of public feeling, with which cheap literature has steadily kept pace, since the reign of George IV. Not even in the most objectionable of the irreligious prints is there anything at all resembling the scurrilities which were at one time prevalent. The classes of books and periodicals which a number of years ago consisted of coarsely offensive attacks on the government, church, laws, etc., have entirely disappeared, and and at no time in its whole history has the book-trade of Great Britain been on a more healthy footing than it is at present.

Limited by the generally imperfect state of education and inaptitude for reading, the ordinary book-trade is also obstructed on account of large sections of the people still speaking some form of the Celtic language, and being unable to understand English. The Scottish Highlanders, Welsh, Manx, and aboriginal Irish, are less or more in this condition. In Wales, there exists a press specially devoted to those who, in remote

parts of the principality, still hold to the ancient vernacular; and the publishing of books and periodicals in the native tongue is conducted with remarkable activity. Some are translations from English works of a useful and popular kind, occasionally illustrated with wood-engravings; and the circumstance of there being a taste and demand for such productions affords a favorable view of the intellectual advancement of the principality. In Ireland, on the contrary, almost the only works printed in the ancient tongue are for the use of scholars, and not, as in Wales, for the poor. The Highlands and Western islands of Scotland produce no literature, native or translated; and the Gaelic books in the hands of the people are extremely limited in variety and number.

Entirely separated from the general book-trade, there flourishes a system of publishing of a peculiar kind. We allude to the *canvassing trade*, which consists in the plan of disposing of books mostly in weekly and monthly numbers or parts. The business is conducted by only a few houses in London, Edinburgh, Glasgow, and one or two other places. Canvassers are employed to go from door to door, to procure subscribers; and the numbers are delivered periodically till the work is completed. On account of the expense of canvassing and delivery, books sold in this manner are necessarily much dearer than if disposed of through the ordinary channels of trade. The method, however, of buying books in small portions at a time, accommodates certain classes of customers, and has been the means of disseminating an improving literature—bibles, with notes and illustrations, and works of piety in particular—in quarters not reached by the operations of the bookseller. During the past twenty years, the canvassing trade has largely been engaged in selling books, and especially bibles, in the complete form. On giving an order, the book or bible is left, and a small sum paid, and a similar sum weekly or monthly. It is said that but few bad debts are made amongst working-men, a fact that speaks well for their honesty.

Apart, likewise, from the general trade, the publication of small books, tracts, and periodicals is carried on to a large extent by associations for religious purposes, the funds for which are raised by voluntary subscriptions. As far as concerns the distribution of purely religious tracts among the unfortunate and less instructed members of the community, no fault is found with the operations of these societies. But when such associations address themselves to the publication of volumes and illustrated periodicals, differing in no material respect from the ordinary products of private enterprise, and intended not for gratuitous distribution, but for sale, a certain injury is felt to be unbecomingly inflicted on the trade, which can no more be justified than the damage done to free competition by the giving of bounties on particular manufactures. Notice has been taken of two periodicals of the religious tract society of London, the circulation of which must be allowed to be fostered in this manner, and other works could be pointed out as being so greatly cheapened by the same objectionable method as to be placed completely beyond the reach of fair commercial competition. See RELIGIOUS TRACT SOCIETY.

Another distinct kind of trade is that of printing and publishing authorized versions of the Bible, New Testament, and Book of Common Prayer. The preparation of these works has always been a prerogative of the crown, which grants exclusive privileges or patent-rights to certain parties for the purpose. From old usage, England, Ireland, and Scotland are treated separately. The last patent for England was granted by George IV. to Andrew Strahan, George Eyre, and Andrew Spottiswoode, for a term of thirty years; and having commenced on the 21st Jan., 1830, it expired on the 21st Jan., 1860, and was then renewed during pleasure. The universities of Oxford and Cambridge have enjoyed the right of printing Bibles, etc., in common with the patentees; but in their case it is a simple affair of permission, they have no power to prohibit or prosecute. See PATENT.

In Ireland, George III., in 1766, granted a Bible patent to Boulton Grierson for forty years. He was succeeded by his son, George Grierson, who, in 1811, obtained a renewal. Trinity college, Dublin, had also a concurrent right; but the English patentees, and both Oxford and Cambridge, are permitted to import their Bibles into Ireland.

In Scotland, the last patent expired in 1839, and was not renewed in consequence of remonstrances from that country, to the effect that if its printing were left free, the Bible would be sold at a considerably lower price than it had hitherto been. Such has proved to be the case. The crown appoints a board with authority to grant licenses to parties desirous to print editions of the Bible and other books falling within the royal prerogative, such as the Confession of Faith of the Church of Scotland, but the importation of English printed editions is not prohibited. (See *Abridgment of Specifications relating to Printing, etc., printed by order of the Commissioners of Patents*, London, 1859.)

The modification of the patent having tended to lower prices, the possibility of any further material reduction seems doubtful. One noticeable feature of the trade in Bibles is, that the publishers in England sell large numbers in sheets. They are bought by bookbinders, who do them up in various styles; some very neatly with gilt edges, which they sell to retailers at about 11*d.* per copy. Other copies, costing, perhaps, not more than 1*s.* or 1*s.* 6*d.* in sheets, are bound in velvet, morocco, tortoise-shell, or other ornamental bindings, and retailed as high as three guineas each. It is computed that in London alone, nearly 1000 persons are employed in binding Bibles, Prayer-books, and other books of devotion. From their cheapness, but more particularly from their accuracy,

English-printed Bibles and New Testaments are purchased in large quantities by the United States. Other large purchasers are the British and Foreign Bible Society. The Society for Promoting Christian Knowledge makes large purchases of Prayer-books and church services in addition.

Although the printing of the authorized version of the Bible, the New Testament, and the Book of Common Prayer, with as well as without notes, seems to be reserved to the nominees of the crown, practically no objection is taken to the printing of these works by others, nor has any objection ever been raised to those printed with notes and comments. Many such editions are accordingly prepared and issued by publishers, often in a style of great elegance. Translations of the Bible, other than the authorized version, are also issued freely by Roman Catholic and other bodies; and at the present time a committee of learned divines is engaged upon a revised version of the English Bible, the copyright of which has been secured by the universities of Oxford and Cambridge, although the revision will not be completed for some years.

The universities of Oxford and Cambridge; also of Trinity college, Dublin; the four Scotch universities; and the colleges of Eton, Winchester, and Westminster, were so much alarmed by the decision of the house of lords in 1772, in favor of Donaldson's right to reprint works not protected by the copyright law of 8 Anne, c. 19, that they applied for and obtained an act of parliament, 15 Geo. III. c. 53, giving them a perpetual copyright of all works belonging to them, or which might afterwards be bequeathed to or acquired by them. The only work in existence older than the present century, claimed by any of the above institutions, to which any value can be attached, is Clarendon's *History of the Rebellion*, with his life and continuation. The right to this and other works possessed by the university of Oxford, was confirmed by the last copyright act, 5 and 6 Vict. c. 45. It will therefore be understood that the printing and publishing of lord Clarendon's *History of the Rebellion* remains an absolute and perpetual monopoly in the university of Oxford—a curious exemption from the ordinary and terminable claim of copyright, and singularly at variance with modern notions of free-trade. It should be added that the profits of the first edition were very great, and were applied by the university towards the erection of the "Clarendon press," which was for a long time the university press; but, its business increasing, the "Clarendon" has been superseded by the "university printing-house;" the former building, a very handsome one, being used for other purposes. (Besides Godson's *Law of Patents and Copyrights*, and *Supplements*, see Dr. Ingram's *Memorials of Public Buildings of Oxford*, new edition, 1848, p. 11.)

Publishers are under the legal obligation to deliver, free, a copy of every book they issue (new editions without alterations excepted) to the five following public institutions: Library of the British museum; Bodleian library, Oxford; university library, Cambridge; Trinity college library, Dublin; and library of Faculty of Advocates, Edinburgh. This obligation, imposed by a clause in the copyright act (see COPYRIGHT), is usually spoken of as an unjustifiable burden, and no doubt it is so; but it is chiefly from causing trouble that it becomes matter for complaint. In comparison with the immense benefits conferred on literature by the public libraries mentioned, the value of the books (with some exceptions) claimed by them is insignificant. In practice, not a hundredth part of the cheap books and sheets issued are given or claimed; which is perhaps unimportant, for if they were, no ordinary building could contain them.

The English book-trade has been lately much indebted to certain liberal post-office arrangements. Manuscripts, proof-sheets, books, periodicals, and catalogues, if left open at the ends, may now be transmitted by post at an exceedingly small charge. See POST-OFFICE.

Unitedly the whole trade of publishing and book-selling forms an important staple of national industry—inferior to some other manufactures and trades, yet great when viewed in relation to its past history, and to the still imperfect state of education among large masses of the people, and respectable from the number of men of high character who are connected with it. In reckoning the number of new works issued from the press annually, we may take the number of entries of distinct books, volumes, sheets, maps, etc., lodged by publishers at the British museum, in terms of the copyright act. The following is an abstract of the return for 1878: Books—complete works, 9456; parts of volumes, works in progress, and periodicals, 26,826; single articles, including play-bills, songs, broadsides, etc., 10,228—total 46,517. Music—complete works, volumes, and pieces, 4369. Maps—350, in 1533 sheets.; atlases, 29. Twenty years ago the number was only about half as great. In 1877, about 5000 new books and new editions were published. In 1876, the books imported into the United Kingdom were valued at £150,099. Of these the value from Germany was £30,568; France, £46,919; Holland, £25,288; the United States, £18,473; and Spain, £6564. The value of English printed books exported in 1876 was £881,839. The United States purchased to the amount of £191,966; Australia, £334,136; Canada, £68,102; British India, £85,269; France, Germany, Holland, and Belgium, unitedly, took to the value of £93,887; our next largest customer being s. Africa, for £40,007. In 1874, the value of books exported was £904,792; of imports, £178,936. It is seen that the exports are five or six fold more than the imports; also that we export to Australia alone more than twice as much as we import from all countries, and to the United States almost a third more than our total imports.

A system of more free and untaxed import of foreign-printed English works would, in various ways, introduce changes into the book-trade, and have a tendency to alter some of its traditional usages.

In Germany, where printing originated, the book-trade became also first established, and the principal mart was Frankfort, to the fairs of which the early book-sellers and printers resorted. Leipsic also became a great mart for books as early as 1680; yet this ancient city is only one of many places of book preparation in Germany. Among them Stuttgart has taken a front rank, since about 1830, as an agency place for the s. German book-trade, whilst Frankfort has now entirely lost its ancient prestige. Throughout the different states of the German empire, more particularly Prussia and Saxony, printing and publishing are largely carried on; and from the various places of publication a great proportion of entire editions of works is transferred to Leipsic agents, who disperse the books throughout Germany, and all those countries for the book-trade of which the city of Leipsic forms the nucleus. Hence arises the important peculiarity of German literature, that literary, artistic, and scientific activity is not limited to or monopolized by any single city, and that, consequently, authors do not need to resort to a metropolis for encouragement or any professional labor. Formerly the book-sellers from the various parts of Germany, and those countries which are dependent, in some measure, upon Germany, on account of affinity of language and identity of aspirations—such as Holland, Belgium, Denmark, Sweden, Norway, etc.—used to meet at Leipsic twice a year, at Easter, and Michaelmas, with a view to exchange their respective publications, and arrange for settlement of mutual accounts. At present, business is done at Leipsic through a system of agencies by commissioners there established. Every book-seller in Germany and the adjacent countries has his commissioner at Leipsic, and to him he forwards packages containing copies of his new publication or publications, on sale or return, for all the book-sellers with whom he has an account. The commissioner then distributes the packages among the Leipsic commissioners, every one of whom is thus enabled, out of the many packages flowing in every week, to make up a case for each of his correspondents. At the end of the year, unsold books are returned to the various senders by means of the Leipsic agency. At Easter, during the fair, the balances are now mostly paid by commissioner to commissioner, the German publishers not resorting as much as formerly to the fair; the extension of railway communication, and other circumstances facilitating business, having somewhat changed the nature of the trade. The method of sending parcels of new works, on sale or return, may not be satisfactory according to English notions, but the advantages of the plan are obvious in various points of view. There is no country in the world where literary and scientific novelties are so regularly made known and become noticed as in Germany. Let the book be what it may, within six weeks after its first publication it is known all over Germany, and, through the personal vigilance of the retailers, is brought everywhere under the notice of those individuals to whom the subject treated of may be of interest. This method of publication has the merit of great simplicity, and secures an exemption from that frightful expenditure on advertisements to make books known, which presses on the English publisher. On this account, as well as from the cheapness of paper and printing, and the simple way that books are for the most part done up, the selling-prices of every variety of production are very moderate. The only drawback on the German publisher is the liability to heavy returns of unsold books; but this he doubtless endeavors to avert by professional tact in his speculations, and a good knowledge of the market. It is, at all events, the belief of those who are well acquainted with the German book-trade, that the method pursued not only furnishes books cheaper, but is more productive to author and publisher than that in England; and that in point of good management and prosperity it exceeds, or at least equals, the book-trade in any other country. From the teeming press of baron Bernhard Tauchnitz of Leipsic has been issued a series of 1760 volumes of cheap reprints of English popular works in a pocket size, which are sold largely in Germany and all other continental countries. It is proper, however, to say that, as there is an international copyright law between Germany and the United Kingdom, these *Tauchnitz editions*, as they are termed, are issued in virtue of an honorable arrangement with English publishers and authors, and are accordingly not to be ranked with the piratical issues of the New York trade. Latterly the sale of German books in England, France, and North America has rapidly increased.

In France, publishing is carried on chiefly in Paris, where there are many extensive printing establishments, including the *Imprimerie Nationale*, provided with machinery equal, if not superior, to anything of the kind in London. As regards substantiality and elegance, French books occupy a place between those of Germany and England. They are, with few exceptions, done up simply in colored paper covers, for temporary service; but the ink is generally better than that used in England; and works, when of a superior class, are executed with a high degree of taste—the excellence of pictorial embellishments being always conspicuous. Certain voluminous and most expensive works in French, and also in the classical languages, occasionally issue from the Parisian press, and command a large sale; orders of copies for university and public libraries all over the continent tending to promote these gigantic enterprises. Although confined mainly to Paris, the business of publishing, or at least of preparing books for the Parisian market, and for exportation, is carried on to a considerable extent in several provincial

towns. Tours, in particular, is the seat of a large book-factory—that of Messrs. Mame—in which printing, designing, engraving, and binding are all executed on the premises.

The French book trade was virtually suspended during the war with Germany, 1870–71, but it may now be said to have fairly recovered, if not surpassed its former condition. The exports are to Italy, Germany, Russia, Holland, Belgium, North America, and other countries, and a portion also comes to England. Between France and the United Kingdom there is now an international law of copyright, by which translations of works are, under certain limitations, protected in either country, when the title-page indicates that "the right of translation is reserved."

In the 17th c., various cities in the Dutch Netherlands bore a prominent place in the book-trade. At Amsterdam, some of the most beautiful editions of the classics, and large numbers of illustrated books, were executed: while from Leyden, and other seats of learning, exports of works in law, theology, etc., formed at one time a prosperous commerce. In this, as in other trades, it has been the fate of Holland to lose its former reputation; it now produces few books in any other language than its own: but the demand for books in the Protestant parts of the country, and the number of booksellers, is perhaps larger than in any other part of the world. That part of the Netherlands now known as Belgium possesses a flourishing book-trade, mainly, we believe, on account of French being the language generally spoken. Brussels, as a kind of minor Paris, is the seat of some extensive printing and publishing concerns; and at Malines, missals, breviaries, and other religious works are produced in large numbers. According to a return of the minister of finances of Belgium, the following was the import and export trade in books for 1872: Value of imports, 3,460,000 francs, of which 70 per cent was from France; value of exports, 3,000,000 francs, of which 40 per cent was to France, and 60 to all other countries.

In Spain, bookselling is almost defunct; even in Madrid it can scarcely be said to have an existence. In Italy, there are signs of revival, but the most active booksellers there are natives of Germany, who, during the last thirty years, have established bookselling houses in the principal cities, Rome, Naples, Turin, Milan, Bologna, Florence, Venice, and Verona, also Triest; and under their auspices the trade may be expected to assume an organized form. Already these intelligent foreigners have done much to keep alive a knowledge of Italian literature.

The book-trade of the United States, which is daily assuming greater proportions, has sprung up from small beginnings within the present century. As in Germany, the business of publishing is monopolized by no particular city, but is carried on successfully in various towns throughout the union. The chief centres are New York, Boston, and Philadelphia; but many books are published at Albany, Buffalo, Baltimore, Washington, New Orleans, Charleston, Cincinnati, Chicago, St. Louis, and San Francisco; and a few in other places. The great distributing houses are located at New York and Philadelphia; and throughout the United States and Canada there are about 6200 booksellers, two thirds of whom unite an exceedingly miscellaneous collection of trades with that of bookselling. A few of the larger publishing houses in New York and Philadelphia, like some in Edinburgh and Glasgow, print, bind, and manufacture the books they sell. Harper's building in New York, and Lippincott's in Philadelphia, each cover nearly half an acre of ground, and cost above £50,000. The annual value of books produced in the United States is unknown. In 1871, upon very uncertain data, it was estimated at $7,000,000, this amount probably being the full selling-price of every volume printed. In consequence of the protectionist policy pursued since the war, the present state of the book-trade is far from satisfactory, and will probably remain so till wiser counsels prevail. English publishers and authors are naturally indignant at the conduct of American publishers persisting in reprinting British copyright works, a practice which, though now decreasing, has been carried on to an enormous extent by the Harpers and the Appletons of New York, and others, in defiance of remonstrance, and even in disregard to the claims of those more scrupulous American publishers who pay for and import early sheets from England. The present state of matters is regretted by the more high-minded Americans as much as it is in Britain.

American books are now executed with neatness and taste; their wood-cut embellishments sometimes surpass those of London; and in point of size and price, they are, for the most part, well adapted for general circulation. On account of the prevalence of education, and also the aspiring habits of the people, book-buyers of a humble position in life are greatly more numerous than they are in the United Kingdom. Few books are purchased by the Irish emigrants, but the Germans are buyers, and many of the colored people are eager in their thirst for knowledge, and their children are all amply provided with schools. Looking on the American trade as, after all, yet but partially developed, it may be expected, in the progress of events, to go on in a vastly accelerated ratio. Latterly, several English publishers have established branches of their business in New York; and there are now some extensive American commission-houses in London—from which intercommunion happy results may be anticipated. Books are sold wholesale by written orders, trade sales, auctions, and otherwise. Country dealers are in the habit of visiting the great book dépôts of Boston, New York, and Philadelphia, and there personally making their selections. As previously stated, there is a large export of American

books to Canada and other British possessions, in which, as yet, native literature is on a poor scale, but where there is a large and increasing number of readers.

In doing up books in cloth boards, the American binders invariably cut off the outer folds of the sheets, so as to smooth the edges of the leaves, as in English leather binding; by which process, the first readers of new books are spared the trouble of cutting open the leaves. Many persons have wished to see this improvement, for such it is, introduced into England. There are still, however, prejudices to be overcome on the subject. Strange as it may appear, numbers of purchasers like to cut up the leaves with a folder as they advance through a new book or periodical, from an idea that the repeated slight interruptions heighten the pleasure of perusal. In our experience, we have known gentlemen who would not sit down to read a cut-up new book. Besides, there is a notion among buyers in England, that books with smooth-cut leaves may be second-hand, and not worth the price of new. Undoubtedly, the Americans are ahead of Europeans generally in this particular.

Notice has been taken of the constant export from Europe to the United States of quantities of high-class books to stock the great public libraries that are everywhere springing into existence through the liberality of state legislatures, or the munificence of private individuals. There is, however, a traffic of a similar kind, more especially from England, in execution of orders for second-hand books from dealers who have establishments in the principal cities in the union, and through whose agency persons of refined tastes are becoming acquainted with the aspect of our older literary treasures. One of these second-hand book-stores in Philadelphia, which we visited some years ago, was on as extensive a scale as anything of the kind in London or Edinburgh, while the choice which it presented would have come quite up to the delicate perceptions of the bibliomaniac.

For a variety of particulars bearing on book-trade in general, we refer to the articles, BIBLIOGRAPHY, BOOK, BOOKBINDING, CENSORSHIP, CIRCULATING LIBRARY, COPYRIGHT, NEWSPAPERS, PAPER, PERIODICALS, PRESS, PRINTING, STATIONER, STEREOTYPING, WOOD-ENGRAVING. W. C.

BOOK TRADE (*ante*). The book trade in the United States is of comparatively recent growth, although printing was introduced into New York as early as 1683. For scholars and libraries the needed books were imported from Europe, but with the spread of newspapers and the development of education, the increasing demand for books offered to publishers a profit from the reproduction of the best works of English literature. The oldest house in the trade is that of Sower, Potts & Co., whose founder, Christopher Saur, sr., made almanacs and German Bibles, near Philadelphia, in 1740. The book production of this country was estimated, in 1820, to amount to only $2,500,000, of which about 50 per cent were original American books; for 1830, $2,500,000, 40 per cent American; for 1840, $5,500,000, or 12,000,000 volumes, 55 per cent American; for 1850, $12,500,000, 70 per cent American; for 1856, $16,000,000, 80 per cent American. These statistics are only estimated, but it shows that the proportion of original American books has steadily increased. The production of books in 1871 was estimated at $40,000,000; 5632 American books were entered for copyright in 1878, and 6580 in 1879; during 1879, the copyright of 5265 of these was perfected by depositing copies in the library of congress as required by law. The trade is usually classified into three divisions—publishing, jobbing, and retailing; but although there are a great number of persons who sell books and periodicals in connection with some other business, there are probably not more than 3000 regular bookstores. About 900 names are given in the *American Catalogue* of those who publish occasionally, but nine tenths of the trade is carried on by about 50 publishers. The "subscription publishers" sell their books through agents and canvassers. Publishers of educational books form a special class, although some of the prominent houses, like Scribner, Appleton, and the Harpers, have educational departments in their business. The "jobber" is the middleman, who orders books in large quantities from the publisher, and distributes them among the retail booksellers throughout the country. Many of the larger houses, like Lippincot, combine the business of the publisher, jobber, and retailer; while others, like Houghton, Mifflin & Co., confine themselves to the sale of their own publications. Every spring and fall there is a "trade sale" in New York, at which large numbers of new publications and standard books are sold to the highest bidders among the jobbers and retailers represented at the sales. The American publishers generally allow the retailers from 25 to 40 per cent, and the jobbers 5 per cent more. The usual forms for books published in this country are 12mo for novels, books of poetry, etc., and 8vo for books of travel, treatises, etc. It is customary among publishers to allow the author of a book a "copyright" payment of 10 per cent on the retail price for all sales; but a gross sum is frequently paid to the author, and the book then becomes the sole property of the publisher. The copyright of a book is granted for 28 years, with the privilege of renewal, by the author, his widow, or children, for 14 years more. A copy of the title-page must be registered in the office of the librarian of congress at Washington before publication, and two copies of the best edition must be sent to the same office within 10 days after publication. The fees are 50 cts. for recording entry, and 50 cts. for each copy of record; there is no other expense. This fee does not, as in the case of patents, cover any investigation into the validity of the copyright, the librarian of congress being only a registering and in no sense a judicial officer. The

most noteworthy attempt to supply the American book-trade with a bibliography was made in the *Bibliotheca Americana* of Roorbach, a catalogue of publications including American issues from 1820, continued by Kelly, in supplements, to 1871; this is now superseded, for current books, by the *American Catalogue*, issued under the direction of F. Leypoldt, containing entries of all books (including imported editions) in print and for sale in this country July 1, 1876. The first volume, now issued, includes the alphabet by authors and titles, covering about 70,000 entries; the second, in preparation, gives the same books under subject-entries. The trade periodicals are the *Publishers' Weekly*, New York, which was begun as the *Weekly Trade Circular* in 1872, by F. Leypoldt, and which afterwards absorbed Child's *Publishers' Circular*, founded in 1852; and the *American Bookseller*, published fortnightly by the American News Co. The *Publishers' Weekly* is especially valuable for its weekly record of current publications, giving full titles, prices, and other information, entered in accordance with the cataloguing system of the American literary association, and furnished with appended descriptive notes, giving briefly the scope, character, and contents of the books. The *American Bookseller*, besides records of new books, includes monthly a useful index, classified by subjects, of the prominent articles in the periodicals of the month.

BOOLAK, or BOULAC, a t. of Egypt, on the right bank of the Nile, 2 or 3 m. n. of Cairo, of which it forms the port. Destroyed by the French in 1799, it was rebuilt by Mehemet Ali, who established cotton, silk, and weaving factories; a government printing-house, from which a newspaper in Arabic is issued weekly; and a school of engineering. It is connected by railways with Alexandria and Suez. Pop. 20,000.

BOOLE, GEORGE, LL.D., 1815-64; an English logician and mathematician. He passed an uneventful life, first as principal of a school at Lincoln, afterwards at Waddington, and as professor of mathematics in Queen's college, Cork. He completed two systematic treatises on mathematical subjects, one on *Differential Equations*, and the other on *Finite Differences*, a sequel to the first. Both soon became standard text-books. B. is also noted in logic for his work, *An Investigation of the Laws of Thought, on which are founded the Mathematical Theories of Logic and Probabilities*. In 1844, he received the royal medal.

BOOLUNDSCHU'HUR, a British district in the lieutenant-governorship of the North-west Provinces of India. With an area of 1910 sq.m., it contained, in 1872, 936,593 inhabitants. It lies in n. lat., between 28° 3′ to 28° 43′, and in e. long. between 77° 28′ to 78° 32′, being bounded to the n. and w. respectively by the districts of Meerut and Delhi. Its chief town of the same name, otherwise called Unchuganj, is on the route between Bareilly and Delhi, being 40 m. to the s.e. of the latter. Its pop. amounts to 14,804; and its distance from Calcutta is 780 miles, its elevation above the level of the sea being almost precisely the same number of feet.

BOOM, in a ship, is a general name for the long poles which jut out from certain supports or uprights, to stretch or extend the bottoms of sails. Some taper regularly from the middle towards both ends; while others have the thickest part at about one-third of the length from one end. According to their particular modes and places of application, they receive the names of *jib B.*, *flying jib B.*, *studding-sail B.*, *lower studding-sail B.*, *main B.*, *square-sail B.*, *driver B.*, *spanker B.*, *ring-tail B.*, *maintopmast B.*, *foretopmast B.*, *fire B.*, etc. In the old 110-gun ships of Nelson's days, these booms varied from 57 to 32 ft. in length, and from 15 to 6 in. in thickness. The war-steamers of the present day require a somewhat different equipment of booms. The immense spread of canvas in some of the clipper merchant-ships now built requires the use of booms of very considerable length. A seaman speaks of "booming" when he applies a B. to a sail; he employs *B. irons*, shaped like the figure 8, to connect booms and other spars together end to end.

Besides the booms on board ship, the same name is also given to a strong iron chain employed in barring the passage of the mouth of a harbor or river, or to cut off the retreat of an enemy if he has actually entered. Such a B. should be protected by a battery or batteries. The chains are moored, and are floated by logs. There should be two such chains, one to afford resistance if the enemy has penetrated the other; they need not extend all across the passage, seeing that shallow spots are self-defended. A modern war-steamer would cut through a chain B., unless made of very thick and strong iron. Sometimes hempen cable booms are used to resist small-craft. The Russians effectually boomed the harbor of Sebastopol, in Sept., 1854, thereby preventing the entrance of English and French ships; this was done partly by sinking some of their own ships, and partly by the laying of booms.

BOOM, a t. of Belg'um, in the province of Antwerp, about 10 m. s. of the city of that name. Its situation at the junction of the Brussels canal with the river Rupel makes it a place of considerable trade. It has numerous and extensive brick and tile works, breweries, tanneries, rope-walks, sail-cloth manufactures, salt-works, etc. Pop. 7464.

BOOMERANG, a missile instrument for war, sport, or the chase, in use by the aborigines of Australia. It is of hard wood, of a bent form; the shape is parabolic. It is about 2 and a half in. broad, a third of an inch thick, and 2 ft. long, the extrem-

ities being rounded. One side is flat, the other rounded; and it is brought to a bluntish edge. The method of using this remarkable weapon consists in throwing it in a particular manner. It is taken by one end, with the bulged side downwards, and the convex edge forward, and thrown directly onward, as if to hit some one thirty yards in advance. Instead of going directly forward, as might be expected, and there falling to the ground, it slowly ascends in the air, whirling round and round, and describing a curved line of progress till it reaches a considerable height, when it begins to retrograde, and finally it sweeps over the head of the projector, and falls behind him. This surprising motion is produced by the bulged side of the missile. The air impinging thereon, lifts the instrument in the air, exactly as by hitting the oblique bars in a windmill, it forces it to go round. The ingenuity of the contrivance, which is worthy of the highest scientific calculation, is very extraordinary as coming from almost the lowest race of mankind. The B. is one of the ancient instruments of war of the natives of Australia. They are said to be very dexterous in hitting birds with it, the animals being of course behind them, and perhaps not aware that they are objects of attack. This curiosity, as it must be called, was first made known by being brought before the royal Irish academy by prof. M'Cullagh in May, 1837.

BOONE, a co. of Arkansas, on the Missouri border; 576 sq.m.; pop. '80, 7,046—48 colored. The land is fertile, producing grain and dairy articles. Fine variegated marble is found. Co. seat, Harrison.

BOONE, a co. in Illinois, on the Wisconsin border; traversed by the Chicago and Northwestern railroad; 270 sq.m.; pop. '70, 12,942; '80, 11,527. It comprises rolling prairie land and forests; producing wheat, corn, rye, oats, barley, potatoes, hay, butter, cheese, and wool. Co. seat, Belvidere.

BOONE, a co. in central Indiana, intersected by the Indianapolis, Cincinnati and Lafayette railroad; 408 sq.m.; pop. '70, 22,593. It is level, with deep and fertile soil, producing grain, potatoes, wool, sorghum, molasses, etc. Co. seat, Lebanon.

BOONE, a co. in central Iowa, on the Des Moines and Snake rivers; traversed by the Iowa division of the Chicago and Northwestern railroad; 576 sq.m.; pop. '70, 14,584. It has productive soil, with abundance of coal. Co. seat, Boonesboro.

BOONE, a co. in Kentucky, on the Ohio river; traversed by the Louisville, Cincinnati and Lexington railroad; 300 sq.m.; pop. '70, 10,696—1012 colored. It has a hilly surface and fertile soil, producing grain, tobacco, and dairy articles. Co. seat, Burlington.

BOONE, a co. in n.e. Missouri, on the Missouri river; 648 sq.m.; pop. '80, 25,444—5,036 colored; surface, prairie and forest; soil productive; stone, coal and limestone are found. Co. seat, Columbia. A branch railroad connects the county seat with the St. Louis, Kansas City and Northern railroad.

BOONE, a co. in e. Nebraska, a part of which is in the Pawnee reservation; 600 sq m.; organized since the census of 1870. Pop. '76, 1,099. Co. seat, Albion.

BOONE, a co. in s.w. West Virginia; 550 sq.m.; pop. '70, 4,553—153 colored; hilly and mainly wooded. Co. seat, Madison court house.

BOONE, DANIEL, a famous backwoodsman and trapper, was born in Virginia, United States. At an early period of his life, he emigrated to North Carolina; but his love of the wilderness not being sufficiently gratified there, he planned an expedition into Kentucky, then almost unknown. On the 7th of June, 1769, along with five companions, he reached the Red river, n. of the Kentucky. B., however, was captured by the Indians, but escaped, and accidentally falling in with his brother, who had pursued his track, they lived together in a cabin during the whole winter. In May, 1770, B.'s brother went home, and B. himself was left alone in the perilous forest. In July, his brother returned, and after exploring a considerable portion of country, they returned in 1771 to Carolina, determined to emigrate with their families to Kentucky; but the attempt proved unsuccessful. Shortly after, B. was engaged as the agent of a Carolina company, in purchasing the lands on the s. side of the Kentucky river, where, in 1775, he built a fort on the site now occupied by the town of Boonesborough. In 1777, the place was twice attacked by a swarm of Indians, who, however, failed to capture it. On the 8th of Aug., 1778, a third attempt was made by 450 savages, officered by Canadian Frenchmen. In spite of repeated assaults, the little garrison of fifty men set at defiance its enemies, who were at length obliged to retire, and never afterwards ventured to besiege the place. After many skirmishes and encounters with the Indians, B. removed in 1798 to Upper Louisiana, where the Spanish authorities gave him a grant of 2000 acres of land. He settled with his children and followers at Charette, on the Missouri river, beyond the inhabited limits of the country, where he followed his favorite occupation of hunting and trapping bears till his death, which occurred in 1822. B. was one of the most adventurous of all those "pioneers of civilization" to whose courage, endurance, and skill America owes so much.

BOONE, WILLIAM JONES, D.D., b. South Carolina, 1813; d. China, 1864; first missionary bishop of the Protestant Episcopal church; a graduate at South Carolina college. He went into law practice, but left it for the ministry, and also studied medicine and

took his degree. In 1837 he went with his wife as missionary to China, and speedily mastered the difficult language. In 1843 he returned to the United States and was consecrated missionary bishop for China in 1844. He returned to China the next year and continued his labors. He came home twice for the benefit of his health, returning finally in Dec., 1859, to look after the new mission in Japan.

BOONES'BOROUGH, one of at least thirty localities in the United States, which take their name from the first pioneer of the great valley of the Mississippi. It stands on the Kentucky, about 18 m. to the s.e. of Lexington. Though now an insignificant village, yet it deserves a prominent place in the history of the mighty West. It was founded in 1775 by Daniel Boone (q.v.), as his first fort; and within three or four years thereafter, it was the seat of the first legislature beyond the Alleghanies.

BOONEVILLE, a city in Cooper co., Mo., on the Missouri river, 43 m. n.w. of Jefferson city, in the midst of a fine agricultural and mining region. It is the main market-place for s.w. Missouri and a portion of Arkansas and the Indian territory, at the terminus of the Booneville branch of the Missouri Pacific railroad, where the Missouri, Kansas and Texas railroad crosses the Missouri river. Pop. 3,506.

BOONTON, a t. in New Jersey noted for iron works; on a branch of the Morris and Essex railroad, and the Rockaway river, 40 m. n.w. of New York, in a rough mountain region. The iron works cover 60 acres, and all branches of the manufacture are carried on. The ore is magnetic, and yields from 50 to 75 per cent of metal. There are blast furnaces, rolling-mills, nut and bolt factories, and a mill for making nail kegs, of which 300,000 are used in a year. The motive power is furnished by the river and the Morris canal. The first nail mill in the country was built in old Boonetown in 1770. The old village was destroyed early in the present century by the breaking of the dam across the river.

BOORGHAS'. See BURGAS.

BOORHANPOOR', or BURHAUNPOOR, a t. in India, once the capital of Candeish, 210 m. e. of Surat; pop. 200,000. It is on a high bank of the Taptee river, surrounded by a rampart of brick, and has in the center a palace of brick known as the Red Fort, built by Akbar, who adorned the town with marble halls, a mosque, and gardens, now nearly in ruins. Trade is monopolized by Arabs. B was founded in 1414 and was for a long time the capital of the country. It was taken in 1599 by Akbar, plundered in 1685 by the Mahrattas, taken from Delhi in 1720, occupied by the English in 1803, restored the same year, and came finally under British protection in 1844.

BOOR'LOS, or BOURLOS, a lagoon in the Nile delta, Egypt, 5 m. e. of Rosetta; 38 m. long, separated from the Mediterranean by a narrow strip of land, but communicating by a single channel.

BOO'RO, an island of the Malay archipelago, about 60 m. to the w.n.w. of Amboyna, extending between s. lat. 3° and 4°, and between e. long 126° and 127°. With an area of 2000 sq.m., it is estimated to contain from 20,000 to 100,000 inhabitants. Though it is mountainous, having Mt. Dome and Tomahoo, respectively 10,400 and 6528 ft. high, yet it is, on the whole, very fertile, its productions being rice, sago, fruits, dye-woods, and cajeput oil. At the e end of the island, the Dutch have a station named Fort Defense; but the best anchorage is on the n. side in Cajeli bay.

BOOROJIRD', or BOOROOGIRD', a t. in the province of Irak-Ajemi, Persia, situated in a fertile valley about 190 m. n.w. of Ispahan. Lat. 33° 43' n., long. 48° 45' e. It has a castle and several mosques. Pop. about 12,000, who are chiefly engaged in agricultural pursuits.

BOO'SA. See BOUSSA.

BOOT, BOOTS, or BOOTIKIN, an instrument of judicial torture, formerly used in Scotland to force confessions from persons accused of crimes, or answers from unwilling or suspected witnesses. Bishop Burnet in the *History of his Own Time*, and sir Walter Scott in his *Old Mortality*, speak of the B. as made of iron; but the rev. Thomas Morer in his *Short Account of Scotland*, written from personal observation of the country at a time when the B. was still in use, describes it as "made of four pieces of narrow boards nailed together, of a competent length for the leg, not unlike those short cases we use to guard young trees from the rabbits." One or both legs of the person to be tortured having been placed in this case, wedges were inserted between the limb and the sides of the case, and these wedges were driven down by the executioner with a mall or hammer, questions being at intervals put to the sufferer, until either he gave the desired information, or fainted away, or showed such endurance as satisfied the judges that no answer could be extorted from him. The wedges were commonly placed against the calf of the leg, but bishop Burnet says he had heard that they were sometimes placed against the shin-bone. In one case—that of a lad in Orkney, in 1596—it is recorded that they were struck home as many as 57 times. In another—that of John Fian, schoolmaster at Prestonpans, burned for sorcery in 1591—it is said that the victim "did abide so many blows that his legs were crushed and beaten together as small as might be, and the bones and flesh so bruised that the blood and marrow spurted forth in great abundance, whereby they were made unserviceable forever." "Still," it is added, "he

would not confess;" and, indeed, it is remarkable in how many cases we are told that the torture, agonizing as it was, failed in its purpose, even where the sufferer "shrieked for pain in terrible manner, so as to have moved a heart of stone." A writer of 1591, after speaking of the "pilniewinks," "pilliwinks," thumb-screws, or thumbikins (q.v.) as a "grievous torture," and of compression of the skull by a twisted cord as "a most cruel torment also," describes the B. as "the most severe and cruel pain in the world." Yet there are instances in which it was not thought enough. When the boots were first used in Scotland is not known. In a case where a deed of conveyance of land was challenged as a forgery, in 1579, two witnesses, a clergyman and a notary, both of Forfarshire, were ordered to be "put in the boots, gins, or any other torments, to urge them to declare the truth." In a letter, still preserved in the state paper office at London, sir Francis Walsingham writes to the English ambassador at Edinburgh, in 1583, that queen Elizabeth desires that father William Holt, an English jesuit then in Scotland, may be "put to the boots." The B. was subject of allusion on the English stage in 1604; in Marston's *Malcontent*, printed in that year, one of the characters is made to say: "All your empirics could never do the like cure upon the gout the rack did in England, or your Scotch boots." A young gentlewoman of Aberdeenshire was tortured by the B. in 1630. Soon afterwards, it is said to have fallen into desuetude for about 50 years. It was revived after the insurrection of the westland Covenanters in 1666, and continued to be used throughout the reigns of king Charles II., and king James II., and during the first years of king William III. "The genius of our nation," writes sir J. Lauder of Fountainhall in 1681, "looks upon the torture of the boots as a barbarous remedy, and yet of late it hath been frequently used among us." The claim of right brought forward by the Scottish convention in 1689, denounced "the use of torture, without evidence, and in ordinary crimes, as contrary to law." Notwithstanding this declaration, the B. was used at least once again. In 1690, Neville Payne, an English gentleman who was supposed to have entered Scotland on a treasonable mission, was put to the torture under a warrant superscribed by king William, and still shown in the register house at Edinburgh. The B. was applied to one leg, the thumb-screws to both hands, but without any effect, although, in the words of one of the privy-councilors, the torture, which lasted for two hours, was inflicted "with all the severity that was consistent with humanity, even into that pitch that we could not preserve life and have gone further." This is believed to be the last time that the B. was used. But it was not until Scotland had ceased to be an independent kingdom, that the British parliament enacted—by the statute 7 Anne, c. 21—that in future "no person accused of any crime in Scotland shall be subject or liable to any torture." Torture is believed not to have been used in England after 1640. It was abolished in France in 1789, and in Russia in 1801.

BOO'TAN. See BHOTAN.

BOÖ'TES, in ancient mythology, the son of Ceres and of Iasion, who, being plundered of all his possessions by his brother Pluto, invented the plow, to which he yoked two oxen, and cultivated the soil to procure subsistence for himself. As a reward for this discovery, he was translated to heaven by his mother with the plow and yoke of oxen, under the name of B., i.e., the ox-driver, which is still borne by one of the constellations. According to others, B. was the son of Lycaon and Callisto, whom his father slew, and set before Jupiter for a repast, to try his omniscience. Jupiter restored him to life, and placed him amongst the stars.

BOOTH. Throughout all Europe, in early times, trade was carried on chiefly by fairs, as indeed is still the case in some parts of it, and in many parts of Asia. The tents, huts, or other temporary or movable structures in which the traders exposed their goods for sale, were called *booths*. Though the corresponding German *bude* is generally referred to *bauen*, to build, our *booth* is traced by some to the Gaelic *both* or *bothag*, a bothy or hut; by others to the Greek *apotheke*, through the Latin *apotheca*, the Italian *boteca*, and the French *boutique*—all signifying an office, shop, store-house, or tavern. From this, its primary sense, B. gradually came to mean a fixed shop or warehouse. As towns sprang up, the yearly fair was more or less supplanted by the weekly market. The slight B. which was set up in the same spot every week, had an irresistible tendency to become substantial and permanent; and the records of the 12th and some following centuries are full of unavailing complaints against the encroachments which were in this way made upon the market-places and streets. Thus, Joceline of Brakelond chronicles the ineffectual efforts of his great and wealthy abbey, in 1192, to dislodge the burgesses of Bury St. Edmunds from the shops, sheds, and stalls which they had erected on the market-place without leave of the monks. So in the Winton *Domesday Book*, compiled in 1148, notice is taken of "houses" in Winchester which had been "stalls." So, also, Stow relates that the houses in Old Fish street, in London, "were at the first but movable boards set out on market-days to show their fish there to be sold; but procuring license to set up sheds, they grew to shops, and by little and little, to tall houses." So, again, the same chronicler tells us that "in Cheapside, from the great conduit w., were many fair and large houses, which houses in former times were but sheds or shops, with solars (that is, lofts or upper chambers) over them." So in Edinburgh the range called at first "the Boothraw," and afterwards "the Luckenbooths," arose in the very center of the High street. So, likewise, in Edinburgh and elsewhere, the trader who for years had

spread his stall under the shelter of the same buttress of the church or town-hall, began to rest a fixed wooden B. against it, gradually transforming the timber beams into lath and plaster, or even into brick or stone, until at length the basement of the stately cathedral, or *hôtel de ville*, was incrusted all over with unseemly little booths (or *krames*, as they were called in Scotland), like limpets on a rock. The B. which thus arose had often but one apartment, which opened on the street by a narrow door, and a broad unglazed window, closed at night by a wooden shutter, dividing in the middle, and hinged at top and bottom, so that the upper half formed a sort of awning, while the lower half served as a table for the display of the trader's wares. It was at this window that business was conducted, the trader standing within, the buyer without. Occasionally a flight of steps led down to a cellar under the B., which served as a store-room. In other cases, a chamber behind was the warehouse of the merchant's B., or the workshop of the craftsman's B., or the sleeping-place of either. As civilization advanced, a "solar" or chamber was raised above the B. for the dwelling-house of the trader, occasionally with a store-room in the roof, to which goods were hoisted by a crane. There is mention of a goldsmith's B., with a "solar" above it, at Perth, about 1230. Traces of the middle-age B. still remain in this country. There are many perfect examples in France, some of them believed to be of the 12th century.

BOOTHS, UNLICENSED, are, by the law of England, public nuisances, and may, upon indictment, be suppressed, and the keepers of them fined. But by the 6 and 7 Vict. c. 68, s. 23, theatrical representations in booths or shows at fairs, feasts, or customary meetings of the like kind, when allowed by the justice of the peace of the district, or other local authorities, are lawful. See THEATERS, LAWS AS TO.

BOOTH, BARTON, a celebrated actor of the 18th c., was born in 1681, his father being nearly related to Henry Booth, earl of Warrington. Having received a good education at Westminster, he was sent at the age of 17 to Cambridge university, from which he ran away to join a company of strolling-players, who were shortly after dispersed by the law. B. next performed at Bartholomew fair with such success that Betterton would have engaged him for Drury Lane had he not been afraid of offending his family by doing so. After a successful engagement in Dublin, he returned to London, and was now engaged at Drury Lane, where he appeared in 1701, and made a great "sensation." He became quite the rage among the nobility, who vied with each other in placing their carriages at his disposal; and he frequently stayed over night at Windsor, where the court was then held. His greatest character was the ghost in *Hamlet*, in which he is said never to have had an equal; and his Othello, according to Cibber, was also a very masterly performance. He died May 10, 1733.

BOOTH, EDWIN, son of Junius Brutus, b. Md., 1833; brought up to the stage by his father, making his public appearance in Boston in 1849. In 1851, he supplied his father's place as "Richard III." at the Chatham theater, New York. The next season he went to California, the Sandwich islands, and Australia (1854), returning to New York in 1857. His most important advance was in 1860, when he played Shakespearean parts at the New York Winter Garden with much success; after a visit to England in 1861, he made New York his home, and played there and in other cities as a star. In 1869, "Booth's theater" was built, where, though more and more successful as an artist, he did not succeed as a manager. For the last four or five seasons he has made brief tours through various parts of the country. He is generally regarded as the leading American tragedian, and in a few great characters he is without a rival. He is not a man of imposing bodily appearance, being rather below the medium stature; but his frame is compact, his carriage at once dignified and graceful, his eye piercing, his features grave. He is thoroughly absorbed in his part, and his voice is under such complete control as to express upon occasion any shade of feeling, sentiment, or conviction. His rendering of familiar Shakespearean passages displays a fine appreciation of their substance and of the lights and shades of manner and expression by which their full meaning may be brought out. In his private life he is greatly esteemed.

BOOTH, Sir FELIX, 1775–1850: an English distiller who gave £20,000 to assist the polar expedition of sir John Ross in 1827. His name is found in "Boothia gulf" and the isthmus of "Boothia." Ross named the whole region around the magnetic pole "Boothia Felix."

BOOTH, JOHN WILKES, son of Junius Brutus; b. Md., 1839, d. April 26, 1865. Though like his brother an actor, he did not achieve notable success. During the rebellion he was in strong sympathy with the South, and at the close of the war he and others formed a conspiracy to assassinate president Lincoln, the vice-president, and members of the cabinet. On the night of Good Friday, April 14, 1865, the president attended Ford's theater, with his wife and some personal friends. About 10 P.M., B. made his way to the door of the box, approached the president unseen, and shot him through the head. Leaping from the box upon the stage, B. exclaimed, "Sic semper tyrannis! The South is avenged!" and escaped by the stage door, where a horse was held for him. In leaping upon the stage he fractured his leg, but with an accomplice he rode 30 m. before resting. When pursuers came up with him he took refuge in a barn, where, as he refused to surrender, he was shot, and died very soon after.

BOOTH, JUNIUS BRUTUS, 1796–1852; an English actor, on his mother's side a relation of John Wilkes, the English statesman. When a boy he went into the navy, but soon left the sea for a printing-office; afterwards studied law, painting, and sculpture. He appeared on the provincial stage, Dec. 13, 1813, and in London in Oct., 1815, at the age of 19. In 1817–18, he and Edmund Kean alternated in the same characters in Drury lane theater. Soon afterwards Booth gained great celebrity in *Richard III.* and "Sir Giles Overreach;" but he was taken with a fancy for travel, and in 1821 arrived at Norfolk, Va. He spent the remainder of his life in the United States, where he was exceptionally popular, and esteemed by many critics to be the greatest tragedian of his time. Though his range of characters was not wide, the people never tired of the best of them, such as "Richard III.," "Sir Giles," "Lear," "Shylock," "Hamlet," and "Iago." In acting he sank the man in the character, and was so intensely carried away that the fencing in *Hamlet* and *Richard* became duels indeed, in which "Richmond" and "Laertes" were compelled to defend themselves in earnest. Like some other great actors, his personal habits were untrustworthy, and late in life there was always much doubt of his being in condition to appear at the places and times promised.

BOOTH, MARY LOUISE, an accomplished author and translator of numerous valuable works from the French, b. New York, April 19, 1831. Her father was descended from one of the earliest settlers, John Booth, a kinsman of sir George Booth, afterwards baron Delamere, who came from England to America about 1649. Her mother is the granddaughter of a French émigré of the revolutionary epoch. Miss Booth's literary career seemed to be foreshadowed in her infancy, as she read Plutarch at five, and Racine in the original at seven; and special care, therefore, was given to her education. At an early age she became a contributor of sketches and translations to various journals; she compiled the *Marble Worker's Manual*, and the *Clock and Watch Maker's Manual;* and devoted herself to the preparation of the first complete *History of the City of New York*, which was published in 1859, a second edition in 1867, and a third edition, revised and brought down to date, in 1880. This work has been extended and illustrated by well-known book collectors. One copy enlarged to folio size, and extended to nine large volumes by the addition of many thousand illustrations, maps, and pictures, is the property of a New York citizen, and is said to be the richest collection of New Yorkiana extant. Another copy with two thousand illustrations is owned by the author, and still another copy has been extended to twenty two volumes by a gentleman of Chicago. Miss Booth has translated many works from the French, notable among which are Méry's *André Chénier*, Victor Cousin's *Life and Times of Madame de Chevreuse*, Marmier's *Russian Tales*, About's *Germaine* and *The King of the Mountains*, Pascal's *Letters*, Sue's *Mysteries of the People*, etc. In 1861, the civil war broke out, and Miss Booth, who was an ardent republican, devoted her pen to the task of interpreting to her countrymen the words of their friends in Europe. She translated in rapid succession count Agénor de Gasparin's *Uprising of a Great People* and *America before Europe*, Edouard Laboulaye's *Paris in America*, and Augustin Cochin's *Results of Emancipation* and *Results of Slavery*, which Charles Sumner declared worth a whole phalanx in the cause of freedom, and in acknowledgment of which she received letters of thanks from president Lincoln and many prominent statesmen of the day. She also translated *Vesper*, *Camille*, and *Human Sorrows* by the countess de Gasparin, and *Happiness* by the count de Gasparin, and maintained during the whole war a constant correspondence with Gasparin, Cochin, Laboulaye, Henri Martin, Montalembert, and other sympathizers with the government, who continually sent documents which she translated and published as a labor of love, in pamphlet form, through the Union League club, in the city journals, and elsewhere. She next turned her attention to Henri Martin's great *History of France*, in seventeen volumes, six of which she translated, but only four of which were published, the encouragement not warranting the continuance of the work. She has since translated Laboulaye's *Fairy Book*, Macé's *Fairy Tales*, and her abridgement of Martin's *History of France* is now in course of publication. In 1867, Miss Booth assumed the sole editorial charge of *Harper's Bazar*, which under her management proved a rapid success, and over which she continues to preside.

BOOTHAUK', a fortified pass of Afghanistan, 12 m. to the e. of Cabul. It runs for 5 m. between cliffs 500 ft. high, and is in some places only 50 yards wide.

BOOTHBAY, a seaport t. in Lincoln co., Me., at the mouth of Damariscotta river, 13 m. s.e. of Bath; pop. '70, 3200. It has an excellent harbor, and is connected by ferry with Bristol. Ship-building, fishing, and coasting trade employ the inhabitants.

BOOTHIA FELIX, a peninsula forming the most northerly part of the American continent. Towards the s. it is terminated by an isthmus, while to the n. it is bounded by Bellot strait (q.v.). It was discovered by sir John Ross during the most famous of his voyages, and named after his friend sir Felix Booth, being supposed at the time to reach as far n. as Barrow strait.

BOOTHIA GULF separates Boothia Felix on the w. from Cockburn island on the e., and is, in fact, a continuation of Prince Regent's inlet towards the south.

BOOTON, an island near the s.e. of Celebes, between 4° 25′ and 5° 45′ s. lat., and in 123° 4′ e. long. Area, 1807 miles. It is mountainous and thickly wooded, produces fine

timber, rice, maize, sago, etc. There are buffalo, swine, horses, and goats. The people are Malays. The chief town, Booton, is walled, and there fine cottons and other stuffs are made. The sultan is in alliance with the Dutch. Pop. 17,000.

BOOTS, which are only a lengthened variety of shoes, are among the most ancient articles of attire. Shoes, extended a certain height up the leg, laced, ornamented, and of fanciful colors, were in use by the ancient Egyptians, Greeks, and Romans, as is seen by existing relics and drawings. Leaving an account of these and other varieties of shoes, as well as an account of the trade and manufacture of shoes and boots generally, to the article SHOE-TRADE, we here confine attention to a few historical particulars respecting what are properly called B., meaning by the term leather coverings for the legs and feet. Different kinds of half-boots were worn by the Anglo-Saxons and Anglo-Normans; and in the reign of Edward IV., if not earlier, the boot-proper, with tops and spurs, was established as an article of knightly dress. (See *Book of the Feet*, by J. Sparkes Hall, London.) In the reign of Charles I., a species of boot, exceedingly wide at the top, made of Spanish leather, came into use; and with Charles II. the highly decorated French boot was introduced as an article of gay courtly attire. Meanwhile, the jack-boot, as it is called (see JACK), had become indispensable in the costome of cavalry soldiers and horsemen generally; and by William III. and his followers it was regularly naturalized in England. Strongly made, the jack-boot extended in length above the knee, was capacious at top, had a very high heel, and round the ankle it had a flat leather band bearing a powerful spur. This huge species of boot remained in use in British cavalry regiments until comparatively recent times, and was dismissed as being too cumbrous in the case of men being dismounted. It is, nevertheless, in a somewhat polished and improved form, still worn by the horse-guards, with whose stalwart appearance, doing duty in their tall B. at Whitehall, most people are familiar.

As an improved jack, the horse-guards boot bears a remarkably close resemblance to the boot of the French postilion, well known to the older class of continental tourists. French postilion B., however, it is proper to understand, are made of that capacity that will suit any ordinary foot and leg. Kept economically as part of the equipment of a posting-house, they are ready for all legs, with or without stockings, as the case may be; and looking at the strength of their materials, they may very fairly be supposed to accommodate all the postboys of an establishment during half a century.

The jack-boot is almost entitled to be called the parent of the top and some other varieties. B. with tops of a yellow color were so commonly worn by gentlemen in the 18th c., as to become a peculiarity in the national costume of the English. When Philip, duke of Orleans, and other revolutionists of note, affected to imitate the sentiments and manners of the English, they ostentatiously wore top-boots. In the early years of the present century, a number of members of the house of commons, among whom may be specified the late sir Francis Brudett, habitually wore top-boots; nor have they yet entirely disappeared. By jockeys and fox-hunters, they are likely to remain in permanent use. What perhaps contributed to break up the general use of top-boots, was the introduction of the Hessian boot as an article of walking-dress. Worn over tight pantaloons, the Hessian boot was a handsome piece of attire, giving, undoubtedly, an elegant appearance to the nether costume. B. of this shape, as is seen by engravings, were worn by English general officers in the early part of the French war, and somewhat later. At length they were superseded by the well-known Wellington boot, which, as its name imports, was introduced by the great duke, as a simplification, under the loose military trouser. This species of boot has, in its turn, been almost entirely abandoned in England, in consequence of the universal use of short ankle B.; but it is still generally used by some classes of persons in the United States, though in an odd fashion, with the trousers stuffed loosely in at the top.

BOOTY is the victors' share in property captured from the vanquished. It is generally a military term, the word *prize* being more frequently used in the navy. The regulations concerning B. in the British army were collected and consolidated in 1831, and have only been slightly altered since. All military B. is apportioned as the sovereign from time to time may direct. Deserters, and those who do not claim their share within six years, receive none. The officers appoint two B. or prize agents, by letters of attorney; the field-officers naming one, and the subordinate officers another. The officer commanding the successful expedition sends two the military authorities a list of the persons entitled to booty. The agents collect the property, convert it into money at the best advantage, and hand over the proceeds to the authorities, receiving a small percentage for their trouble. A scale of distribution is then made out, and the money is paid after a certain interval. When an army and a fleet join in a capture, the admiralty calculates the army share, and sends the amount to the military authorities. Prize and B. originally belonged to the sovereign, and are only distributed to the captors as an act of grace; for, if the sovereign pleases, the property can be given back again to the enemy. See further, under PRIZE.

BOPP, FRANZ, Ordinary Professor of Oriental Languages at Berlin, was born at Mainz, on the 14th Sept., 1791. Devoting himself exclusively to the study of oriental literature, he spent some years in Paris, where he was encouraged in his labors by Chezy, Silvestre de Sacy, and August Wilhelm Schlegel, and afterwards visited

London, to prosecute his favorite studies more thoroughly, being partly supported by a small pension from the king of Bavaria. His first publication was on the Sanscrit verb; he afterwards produced a Sanscrit grammar, a *Glossarium Sanscritum*, and editions of several fragments of the great Indian epic, the *Mahabharata*, in the original text, with a translation. He helped much to facilitate the study of Sanscrit in Europe. But his most important labors centered in the analysis of the grammatical forms of the different languages of the Indo-Germanic family, by which he may be said to have founded a new science of comparative grammar. His great work in this department is a comparative grammar of the Sanscrit, Zend, Greek, Latin, Lithuanian, Old Slavonian Gothic, and German (*Vergleichende Grammatik*, etc., Berl. 1833, etc.; a second edition, entirely recast, was published in 1857). An English translation by lieut. Eastwick, and conducted through the press by Mr. Wilson, Boden professor of Sanscrit in Oxford university, was published in 3 vols., 1845–50. In recognition of his splendid services to philology, he was, in 1842, made a knight of the newly erected French, *Ordre du Mérite*, and, in 1857, foreign associate of the French institute. He died in 1867.

BOPPARD or BOPPART (ancient *Baudobriga*), a walled t. of Rhenish Prussia, situated on the left bank of the Rhine, about 9 m. s. of Coblenz. B. is a very ancient place, with dark, narrow streets, and chiefly built of wood. Its appearance, however, is picturesque, and it has several buildings, architecturally remarkable. The church of the Carmelites contains some fine specimens of 16th c. sculpture. During the middle ages, B. was an imperial city, and many councils were held in it. Remains of the Roman fortress built by Drusus still exist in the town. Near B. is Marienberg, the famous hydropathic resort. Pop. '75, 5269.

BORA, KATHARINA VON, or CATHARINE DE BORA, the wife of Luther, was b., it is supposed, at Löben, near Schweinitz, in Saxony, on 29th Jan., 1499. At a very early age, she entered the Cistercian convent of Nimptschen, near Grimma. Becoming acquainted with Luther's doctrines, she found herself very unhappy in her monastic life; and finally, along with eight other nuns, whose relatives, like her own, refused to listen to them, she applied for assistance to Luther. Luther obtained the services of Leonhard Koppe, a citizen of Torgau, and by him and a few associates the nine nuns were liberated from the convent in April, 1523. They were brought to Wittenberg, where Luther had suitably provided for their reception. Catharine became an inmate in the house of the burgomaster Reichenbach. Luther, through his friend, Nicholas von Amsdorf, minister in Wittenberg, offered her the hand of Dr. Kaspar Glaz, who became pastor in Orlamunde. She declined this proposal, but declared herself ready to marry Von Amsdorf, or Luther himself, who had already laid aside his monastic dress. Her marriage with Luther took place on 13th June, 1525, and was made the occasion of much unjust reproach by his enemies, which has not ceased to be repeated to this day. In his will, he left her all that he had, so long as she should remain a widow, because, as he says, she had always been an affectionate and true wife to him. After Luther's death, the elector of Saxony and Christian III. of Denmark, contributed from time to time to her support. She died at Torgau, on 20th Dec., 1552.

BORACIC ACID is found native (1) in the steam or vapor which rises from certain volcanic rocks in Tuscany, and (2) as a saline incrustation in the crater of a mountain in the island Volcano, which is situated 12 m. n. of Sicily. This crater is about 700 ft. deep, the sides lined with a crust of B. A. about half an inch thick, and is sufficient to yield an annual supply of 2000 tons. B. A. also occurs in combination in borax (q.v.), datholite (q.v.), boracite, and other minerals, and to a very minute extent in trap-rocks generally. The Tuscan supply of B. A. may be regarded as the most important, and its collection takes place over an area of about 30 miles. The plan pursued is to form a series of caldrons—100 to 1000 ft. in diameter, and 7 to 20 ft. deep—partly by excavation, and partly by building, in the side of the volcanic mountain where the steam and B. A. vapors are issuing from fissures, and divert the course of a mountain stream, so that at pleasure the caldrons, or *lagoons*, may be supplied with water. As the volcanic vapors—called *suffioni*—gurgle through the water contained in the lagoons, the B. A. is arrested by the water, which becomes impregnated with it. The liquid is passed from one lagoon to another, then on to settling vats and flat-bottomed evaporating pans, till it becomes so concentrated that on cooling, impure crystals of B. A. separate. In this condition it is sent to England and other countries. The appearance of the surface of the ground, from which thousands of jets of steam are constantly issuing, is very striking; and the name given to one of the principal mountains, *Monte Cerboli* (*Mons Cerberi*), denotes the feeling of awe with which the peasantry regarded the district as the entrance to the lower regions. Native B. A. is employed as a source of borax (q.v.) and contains about three fourths of its weight of true B. A., accompanied by one fourth of water and impurities. In a pure condition, B. A. may be prepared by dissolving 40 parts of borax ($NaO,2BO_3$) in 100 of water, and acting thereon by 25 parts of hydrochloric acid (HCl), which removes the soda, forming chloride of sodium (NaCl) and water (HO), and on cooling the mixture, the B. A. (BO_3) crystallizes out. On re-solution in water and re-crystallization, it is obtained in pure white feathery crystals. B. A. is used in the arts as a flux, as an ingredient in the glaze employed in pottery; and the wicks of stearine and composite candles are treated with it, so that when the candle is

burning, the end of the wick when it gets long, may fuse and fall to the side, where it can be burned away. The exportation of B. A. from the Tuscan logoons exceeds 3,000,000 lbs. annually.

BORAGE, *Borāgo*, a genus of plants of the natural order *boragineæ* (q.v.), having a wheel-shaped corolla, the mouth of which is closed with five teeth, and forked filaments, of which the inner arm bears the anther, the anthers connivent around the style, in the form of a cone. The species are few, chiefly natives of the countries around the Mediterranean sea. The COMMON BORAGE (*B. officinalis*) is found in waste places in many parts of Europe, and is pretty frequent—perhaps naturalized—in Britain. It is a plant of rather coarse appearance, with a stout erect herbaceous stem, 1 to 2 ft. high, somewhat branched; the lower leaves elliptical, obtuse, tapering to the base; the stem, leaves, flower-stalks, and calyx rough with hairs. The flowers are more than half an inch broad, of a beautiful blue color. B. was formerly much cultivated and highly esteemed, being reckoned amongst the *cordial* flowers, and supposed to possess exhilarating qualities, for which it no longer receives credit. The belief in its virtues was at one time extremely prevalent in England, and its use accordingly universal. The flowers were put into salads, Gerarde tells us (1597), "to make the mind glad;" and he adds: "There be also many things made of them, used everywhere for the comfort of the heart, for the driving away of sorrow, and increasing the joy of the mind." Like some other plants of the same order, B. contains nitrate of potash (niter), and is slightly febrifuge. It is mucilaginous and emollient, and has been used in pectoral affections: its leaves impart a coolness to beverages in which they are steeped: and with wine, water, lemon, and sugar, enter into the composition of an English drink called a *cool tankard*. The young leaves and tender tops are pickled, and occasionally boiled for the table.

BORAGINEÆ, or BORAGINA'CEÆ, a natural order of dicotyledonous plants, consisting chiefly of herbaceous plants, but also containing shrubs and even trees, the leaves generally rough with hairs which proceed from a thick hard base, and the whole plant mucilaginous and emollient. The leaves are alternate and without stipules. The flowers are in spikes, racemes, or panicles which are almost always coiled up, and gradually uncoil and elongate themselves, the flowers expanding in succession. The calyx is 4 to 5-partite, and remains till the fruit is ripe; the corolla is generally regular, 4 to 5-cleft, imbricated in bud; the stamens rise from the corolla, and are equal in number to its divisions—generally five—and alternate with them. The ovary is 4-partite, 4-celled; the style simple, arising from the base of the lobes of the ovary. The fruit consists of 4—or sometimes of 2—distinct achenia. See ACHENIUM.—The order *ehretiaceæ* of some botanists differs chiefly in the fruit, which in the more typical species is a succulent drupe; and in the heliotropes consists of four dry achenia more or less consolidated.—There are about 600 known species of the proper *boragineæ*, and about 300 of *ehretiaceæ*. The former are natives principally of temperate climates, and are particularly abundant in the s. of Europe and in the temperate parts of Asia; the latter are more tropical, but not exclusively so. Borage (q.v.), alkanet (q.v.), comfrey (q.v.), and forget-me-not (q.v.) are familiar examples of the former; the exquisitely fragrant heliotrope (q.v.) is the best known of the latter. The drupes of some species of *ehretia* are eatable.

BO'RA SAM'BA, a curious little half-independent state, or raj, in India, within the jurisdiction of the political agent for the s.w. frontier of Bengal. Its central point is in n. lat. 20° 55', e. long. 83° 10'; its area is about 622 sq.m.; the pop. is estimated at 28,000. The country is rugged, and the people savage. Outlaws from other parts of India have too often found refuge here. The revenue is about £400 a year. A tribute of £16 is paid to the British government.

BORAS'SUS. See PALMYRA PALM.

BORAX, or BIBO'RATE OF SODA, is found native as a saline incrustation on the shores of certain lakes in Persia and Thibet. It also occurs in India, China, Ceylon, Saxony, and South America. When collected on the banks of the lakes, it is impure, and goes by the name of *tincal*. The latter is purified by acting upon it with a solution of caustic soda, which removes the fatty matter that the crystals are coated with, to prevent evaporation of the water they contain, and thereafter dissolving in hot water and recrystallizing. B. is likewise prepared from boracic acid (BO_3), (q.v.), by solution in boiling water, and the addition of a boiling solution of ordinary carbonate of soda ($NaOCO_2$), when B. ($NaO,2BO_3$) is formed, and carbonic acid (CO_2) is disengaged, and on cooling in wooden tanks lined with lead, the crystals of B. separate. The common crystalline variety of B. contains 10 equivalents of water ($NaO,2BO_3 + 10HO$); but if a stronger than ordinary solution be allowed to cool, crystals begin to separate at a higher temperature than usual, which contain only 5 atoms of water ($NaO,2BO_3 + 5HO$). B. is soluble in water to the extent of one part of the salt in two parts of hot water, and in twelve of cold, yielding a clear solution with a sweetish taste. It is readily reduced to powder, and is then known as *powdered borax*. It is of great use in the chemical arts. As an assistant agent in experimenting with the blow-pipe (q.v.), B. is of great service, from the readiness with which it forms colored glasses with the various metallic oxides. It

is also employed in the manufacture of enamel, and for glazing or coating vessels in English pottery, as also in the formation of the paste for artificial gems. To the metallargist, it is an aid in the readiness with which it promotes the fusion of metallic mixtures, and the separation of the metals; and to the solderer of all metals it is of service in forming a thin glassy coating over the edges of the metals, which prevents their oxidation at the time they are being joined together. B. is also used in dyeing.

BORBECK, a t. in Prussia on the Ruhr, 4 m. n.w. of Essen; pop. '71, 16,857. It has a castle. Its iron industry is large, and there are coal-mines in the neighborhood.

BORDA, JEAN CHARLES, an eminent practical mathematician and astronomer, was b. on 4th May, 1733, at Dax, in the department of the Landes, in France. In 1771, he was associated with Verdun and Pingré in proving the accuracy of chronometers. He also devoted much attention to the subject of ship-building, and suggested great improvements in the form of vessels. In 1787, he took an active part in bringing the observatories of Paris and Greenwich into closer relations with one another. Along with Delambre and Méchain, he was a leading member of the French commission intrusted with the measurement of a meridian arc. He rendered essential service in the commission on the new system of weights and measures. He invented a new instrument for measuring the inclination of the magnetic needle; and his corrections of the seconds pendulum are still in use. But his reputation depends most of all on his improvement of the reflecting circle, on which instrument he published a work in two volumes (Par. 1787). He died at Paris on the 20th Feb., 1799.

BORDEAUX, an important seaport town of France, chief town in the province of Gironde, beautifully situated in a plain on the left bank of the Garonne, about 60 m. from its mouth in the Atlantic. Ships of more than 1000 tons burden can easily ascend the river at high-water to B., which is accessible at all times to vessels of 600 tons. Its harbor is very capacious; and, by the Garonne, its commerce very extensive. The river is crossed by a noble bridge of 17 arches and 532 yds. in length, erected by the elder Deschamps in 1811–21. The old town, consisting partly of high wooden houses of the 15th c., has narrow crooked streets; but the newer parts of the city and the suburbs have wide streets, fine squares, and pleasant promenades lined with trees. The cathedral, which was consecrated in 1096, is remarkable for its beautiful towers. The church of St. Croix is a building of the 10th c.; that of St. Seurin is also very old, and has rare Gothic ornaments. The former archiepiscopal palace is now the town. The great theater is one of the largest and finest buildings of its kind in France. B. has many other fine public buildings, and learned associations, and educational and benevolent institutions, with a public library of upwards of 140,000 volumes. The university, founded by pope Eugenius IV. in 1441, has been, since 1839, an *Académie Universitaire*, with 15 professorships. Pop. in 1876, 212,111.

Among the principal branches of industry are the production or preparation of sugar, brandy, liquors, vinegar, nitric acid, printed calicoes, woolen goods, carpets, hats, paper, earthenware, glass bottles, metallic wires, madder, and resinous articles. The rope works, cooperages, and dock-yards are extensive and full of activity. The canal du Midi, connecting B. with the Mediterranean, enables it to supply the whole s. of France with the colonial produce which it imports; and also with English tin, lead, copper, coal, dye-stuffs, herrings, etc. Wine, brandy, vinegar, dried fruits, hams, turpentine, and glass bottles are among its principal exports.

Except the wines of Champagne, no French wines are so much exported to foreign countries as those grown in the district of B., and known as BORDEAUX WINES. Some of them are red (known in England as *claret*), others white. Of the red wines, the Medoc is one of the best known. The red wines produced by the vineyards of Lafitte, Latour, Château-Margaux, and Haut-Brion are particularly celebrated for their quality. The white wines of Graves, and those of Sauternes, Barsac, Preignac, and Langon are in highest repute.

In former times, B. was called *Burdigala*, and was the capital of the *Bituriges Vivisci*. It was a very prosperous town in the times of the Romans, was made by Hadrian the capital of Aquitania Secunda, and was both the principal emporium of the s.w. of Gaul, and the seat of its best educational institutions. It was taken by Charles Martel in 735, but was again spoiled by Norman plunderers in the 9th century. It became the capital of the duchy of Guienne; and in 1152 passed, by the marriage of Eleanor of Guienne with Henry of Normandy (afterwards Henry II. of England), under the dominion of England. B. was for a considerable time the seat of the splendid court of Edward the black prince. During the revolution, B. was the principal seat of the Girondists, and suffered fearfully at the hands of the Terrorists. Its inhabitants, disaffected to Napoleon's government, were the first to declare for the Bourbons in 1814. During the Franco-Prussian war, a delegation of the government of national defense, retreating before the advancing German army, stationed itself, Dec., 1870, at B.; and the first sittings of the national assembly in 1871 were held there. Since the restoration of peace, the export-trade of B. has increased greatly. In wines, there was an increase, between 1859 and 1871, of 124 per cent in the quantity, and 73 per cent in the value—arising from the amount of cheap wine shipped from the port during the two previous years. About one sixth of the total export of this article goes to the British dominions.

BORDELAIS, a district of France, once forming part of the old province of Guienne, and having Bordeaux for its capital, but now included in the department of Gironde and Landes.

BORDEN, SIMEON, 1798–1853; b. Mass.; an engineer, self-educated; inventor of an apparatus for measuring base lines in trigonometrical surveys; and superintendent of the state survey of Massachusetts, the first geodetic survey in the United States. He published *A System of Useful Formulæ adapted to the Practical Operations of Locating and Constructing Railroads*, and was himself the constructor of several such roads.

BORDENTOWN, a village and township in Burlington co., N. J., 6 m. s.e. of Trenton; pop. '80, 5,334. It is on the bank of the Delaware river, and on the Raritan canal, and the Camden and Amboy railroad. Manufacturing is the principal business. Near B. is the former residence of Joseph Bonaparte, brother of Napoleon. The Bordentown college for women is the principal institution of learning.

BORDER, THE, is a term employed in historical as well as popular phraseology to signify the common frontier of England and Scotland. At present, the dividing boundary of the two countries consists partly of natural and partly of imaginary outlines. It is customary to speak of Scotland as a country "north of the Tweed;" but the Tweed is the boundary only in a small part of its course, on the e., and large portions of several Scottish counties lie to the s. of that river. Even at its mouth, the Tweed is not the division; for n. of the river at its estuary lies the ancient town of Berwick, with the district known as its "bounds," which belong to England. The Tweed forms the division only for about 16 to 18 miles. Leaving the river at Carham Burn, a few miles above Coldstream, the line proceeds towards the Cheviot mountains, the ridge of which is the boundary for about 25 m.; descending thence, the line strikes on Kershope water, a tributary of the Esk. That river is the boundary for a number of miles to a point above Longtown. The line now quits the Esk abruptly in a northern direction, and taking into England part of what was known as the "Debatable Land" (q.v.), strikes on the small river Sark, which is the boundary to the Solway firth, the great natural division on the west. Such, in general terms, is the entire boundary, extending from sea to sea for about 100 m., in which length the Tweed obviously plays an inferior part. The counties lying on the English side of the border are Northumberland and Cumberland; on the Scottish side, Berwickshire, Roxburghshire, and Dumfriesshire. Readers of history are aware that the division here indicated is comparatively modern; in former times, the frontier shifted according to the surging tide of war or diplomacy. For several ages prior to the 11th c., the kingdom of Northumbria, forming a part of what we now call England, included all that portion of Scotland s. of the firth of Forth as far w. as Stirling. As a result of some warlike operations, this district was ceded by the earl of Northumberland to Malcolm II., king of Scots, 1018, and ever since the Tweed, in its lower part, has been the boundary. What, however, was gained by Scotland on the e. was lost on the w.; for William the conqueror wrenched Cumberland from the northern sovereign; and with little intermission the boundary in this quarter was settled according to its present limits.

It may be said that from the 11th till the end of the 17th c., there was almost constant disturbance on the border. Ruthless wars on a great scale between English and Scots sometimes caused the most frightful devastation, and became the source of lasting ill-will on both sides. History abounds in events of this kind, and the feuds and forays of clans and families are commemorated in a series of ballads, forever embalmed in the *Minstrelsy of the Scottish Border*, by sir Walter Scott. The most notable of these forays from the Scottish side is narrated in the ballad of the *Battle of Otterburne*, or, as it is sometimes called *Chery Chase*. The event referred to occurred in 1388. Among the latest of the regular invasions from England was that in 1543, in the reign of Henry VIII., conducted by the earl of Hertford. The invasion was by the eastern marches, and in their devastating course, the English army set fire to and destroyed all the towns, villages, monasteries, and numerous castles within a wide range of country. At an early date, wardens and commissioners had been appointed to repress petty insurrections, and punish the moss-troopers who made cattle-lifting from their neighbors on the opposite side of the border a kind of profession. For these measures of police, the border was divided into three parts—the east, middle, and western marches. Such was the lawlessness in the early part of the 16th c., that in 1511, sir Robert Kerr, warden of the eastern marches, was slain at a border meeting by three Englishmen. The principal murderer escaped as far as York, and for a time tried to conceal himself; but he was sought out by two of sir Robert's followers, who brought his head to their new master, by whom, in memorial of their vengeance, it was exposed at the cross of Edinburgh (Scott's *Essay on Border Antiquities*). Sometimes the Scottish borderers met ostensibly to amuse themselves with the ancient sport of football, but in reality to plan and execute daring military exploits. During the reigns of Elizabeth and James VI., strenuous efforts were made to preserve peace on the border, and this was attained only by extraordinary severities. Many of the more audacious reivers were hanged, and great numbers were banished. Some account of the measures adopted at this period to suppress border outrages will be found in the *Memoirs of Sir Robert Cary*, who long acted as English warden on the marches; also in the *Domestic Annals of Scotland*, by R. Chambers, vol. i.

After the accession of James to the English throne, a sweeping clearance of the Scottish border was effected. The laird of Buccleuch collected under his banners the most desperate of the border marauders, whom he formed into a legion for the service of the states of Holland. At the same time, the debatable land was cleared of the Græmes, a daring sept of freebooters, who were transported to Ireland, and their return prohibited under pain of death. The legislative union of 1707, and the firm administration of justice, along with a general improvement in manners, finally terminated the long course of misrule.

In the present day, there is nothing to distinguish the border from other districts of the country, unless it be the prevalence of picturesque ruins of old castles, generally roofless, but, from the vast thickness and strength of the walls, still in a good state of preservation. The border strengths were of three kinds—regular fortresses, large baronial castles, and the lesser kind of towers. On the e., the English owned the fortified town of Berwick, and at no great distance Newcastle-on-Tyne; and on the w., Carlisle. The chief Scottish border fortresses were the royal castles of Roxburgh, Jedburgh, and Lochmaben; and we might almost include Edinburgh castle, for it is only 60 m. distant. Among the baronial castles on the English side were numbered Norham, Alnwick, Bamborough, Naworth, Brougham, Penrith, and Cockermouth. Among the Scottish fortlets of the baronial class may be mentioned Newark, Hermitage, and Caerlaverock. The smaller kind of towers on both sides of the frontier appear to have been exceedingly numerous, and it is their remains that form the more conspicuous memorials of old border strife. These buildings consist of a single square tower, usually of three floors; the lower vaulted, for the reception of cattle; while the two upper, consisting of but one small apartment each, with narrow slit-hole windows, comprised the accommodation for the family. It is conjectured, however, that retainers lived in thatched huts outside, which are now obliterated, and were brought into the tower, along with the cattle, only in the case of an anticipated attack. These towers, known as bastel-houses or peels, once the residences of a warlike yeomanry, are thickly studded over the s. of Scotland, more particularly along the vale of the Tweed; and by the lighting of beacons on their summits, the whole country between the border and the Forth could be speedily summoned to arms. On the English side, there are similar towers, such as those of Thirlwall, Fenwick, and Widdrington. The English border castles of every kind appear to have been of greater splendor and strength than those on the Scottish side. "Raby castle, still inhabited, attests the magnificence of the great Nevilles, earls of Westmoreland; and the lowering strength of Naworth shows the power of the Dacres" (*Scott*). On the English side, however, there is nothing which can be compared to the ruins of that remarkable group of Scottish border abbeys—Melrose, Dryburgh, Kelso, and Jedburgh, not to speak of the remains of various other religious houses. For an account of these and other architectural remains on the border, we must refer to the *Border Antiquities of England and Scotland*, by sir Walter Scott, 2 vols. folio, illustrated with plates; also to Billings's *Baronial and Ecclesiastical Antiquities of Scotland*, 4 vols. 4to, illustrated with plates.

Assimilated in habits to the rest of the population, the old Scottish border families are still distinguishable by their surnames—as, for example, the Maxwells, Johnstons, and Jardines on the w., and the Elliots, Armstrongs, Scotts, and Kerrs on the middle and eastern marches. The principal Scottish border families of rank are the Scotts, dukes of Buccleuch, descendants of a famed border chief, sir Walter Scott of Buccleuch; and the Kerrs, dukes of Roxburgh, who are sprung from an equally celebrated borderer, sir Robert Kerr of Cessford. The possessions of both families are extensive, particularly those of Buccleuch (q.v.), which spread through several counties. The family of corresponding rank within the English border is that of the Percies, dukes of Northumberland. Local intercourse across the border is considerably obstructed by the long range of hills and the moors which generally lie on the line of boundary; and the circumstance of the peculiar civil and ecclesiastical institutions of the two kingdoms shedding off here towards different centers, still further tends to lessen community of feeling. At no distant day, certain exciseable articles were charged with a less duty in Scotland than England, and the consequence was an active contraband trade on the border, chiefly by the mountain-passes and the Solway. Now, these duties are assimilated, and this demoralizing kind of traffic has disappeared. The great channels of communication across the border are two railway routes, one by way of Berwick, and the other by Carlisle. There are also good roads in various directions for those who wish to explore this interesting district of country. Besides the books relative to the border already referred to, there are some works of local note, among which the most comprehensive is Richardson's *Borderer's Table-book*, 8 vols. royal 8vo (Newcastle-on-Tyne); we may also refer to Jeffrey's *History and Antiquities of Roxburghshire*, 3 vols.; and Ridpath's *Border History*, 1 vol. 4to. W.C.

BORDER-WARRANT, in the law of Scotland, is a warrant issued by the judge ordinary—that is, by the sheriff or county court judge, or by magistrates of royal burghs within the royalty, or by justices of the peace—on the borders between Scotland and England, on the petition of a creditor who desires to arrest the person or effects of a debtor residing on the English side, and to detain him until he finds bail for his appear-

ance in, and abiding the result of, any action which may be brought for the debt within six months. The creditor must swear to the truth of the debt, and before resorting to imprisonment of the debtor, it is proper to examine him as to his domicile, or usual residence, and occupation. These warrants are in use in the counties of Dumfries, Roxburgh, and Berwick. They are more used in the country districts than in the burghs, though not frequently even in the country districts. In Dumfriesshire and Berwickshire, border-warrants are granted exclusively for arresting the persons of alleged debtors. In Roxburgshire—with the exception of the courts of the justices of the peace in Kelso and Melrose districts, which follow the practice of the two first-named counties—the warrants are granted for the purpose of arresting both the debtor's person and goods. In the stewartry of Kirkcudbright, and in Wigtonshire, they are unknown.

In English practice, the warrant to arrest an absconding debtor, which includes any foreigner who may be in England on business or pleasure, is very similar. See ARREST-MENT FOR FOUNDING JURISDICTION; DEBTORS, ABSCONDING; FOREIGN ATTACHMENT; JURISDICTION.

BOR'DURE, or BORDER, in heraldry. Coats of arms are frequently surrounded with a B., the object of which is generally to show that the bearer is a cadet of the house whose arms he carries. The character of the B. often has reference to the profession of the bearer: thus, a B. *embattled*, is granted to a soldier; and a B. ermine, to a lawyer.

BORE is a tidal phenomenon at the estuaries of certain rivers. When a river expands gradually towards a very wide mouth, and is subject to high tides, the spring flood-tide drives an immense volume of water from the sea into the river; the water accumulates in the estuary more rapidly than it can flow up into the river; and thus there is gradually formed a kind of watery ridge stretching across the estuary, and rushing up towards the river with great violence. In some cases, this ridge, or B., is many feet in height, and contends against the descending stream with frightful noise. This phenomenon is observable in several British rivers, as the Severn, Trent, Wye, and Solway. The most celebrated bores are those of the Ganges, Brahmaputra, and Indus: in the Hoogly branch of the Ganges, the B. travels 70 m. in 4 hours, and sometimes appears suddenly as a liquid wall 5 ft. in height.

BORE is a name for the internal cavity of a cannon, mortar, howitzer, rifle, musket, fowling-piece, pistol, or other kind of fire-arm. It is in most cases cylindrical; but in the Lancaster gun the B. is oval; in the Whitworth gun, it is hexagonal; while in the Armstrong, and many other kinds of gun, it is furrowed by spiral grooves. Technically, the B. of a gun often means simply the diameter of the cavity, as when we speak of a gun "of 8-inch bore;" and in that case its meaning is equivalent to "caliber."

The BORING of a cannon is a process which may best be described in connection with CANNON FOUNDING. It is desirable to mention in the present place, however, that there is an operation called "boring-up" conducted at Woolwich arsenal, for enlarging the bore of a gun. It has been found in recent years that many of the old cannon are thicker and heavier than needful for the size of shot propelled, and that they could be fitted for the discharge of larger shot without danger. A change was begun in the armament of the British fleet in 1839 by substituting heavier broadsides; and as one part of the process, many of the old 24-pounders were "bored-up" to 32s; even some of the 18-pounders were found to be thick and strong enough to undergo this process. More than 2000 iron naval guns were thus treated at Woolwich preparatory to the change in 1839; and many others have since been similarly bored-up. About 1860, important experiments were carried on at Woolwich, to determine whether the old smooth-bore iron guns could not only be bored-up, but *rifled* at the same time. There were 15,000 of such guns belonging to the British government, and it was suggested that they ought to be improved, instead of being cast aside as useless in the event of the success of the Armstrong and Whitworth guns. The process has not proved altogether satisfactory.

BO'REAS, the Greek name of the n.e. wind, blowing towards Hellas from the Thracian mountains, and personified in mythology as the son of Astræus and of Eos or Aurora, and the brother of Notus, Zephyrus, and Hesperus. B. was said to dwell in a cave of the Thracian Hæmus, to which he carried Oreithyia, the daughter of the Athenian king Erechtheus, who bore him Zetes and Calaïs—employed as the symbols of swiftness—and Cleopatra, the wife of Phineus. According to Homeric fable, he begat, with the mares of Erichthonius, twelve horses of extraordinary fleetness. The rape of Oreithyia was represented on the arc of Cypselos, where B. instead of feet has the tails of serpents. He had a temple in Athens, because he destroyed the ships of the Persians under Xerxes: and at Megalopolis, a yearly festival was celebrated in his honor, because upon one occasion he helped the Megalopolitans against the Spartans.

BO'RECOLE. See KALE.

BORELLI, GIOVANNI ALFONSO, a distinguished mathematician and astronomer, and the founder of the iatro-mathematical school, born at Naples in 1608, was educated at Florence, and became professor of mathematics at Pisa, and afterwards at Messina. Having taken part in a revolt, he was obliged to leave Messina, and spent the remainder

of his life at Rome, where he enjoyed the patronage of queen Christina of Sweden, and where he died in 1679. He carefully observed the motions of the satellites of Jupiter, then little known, and seems to have been the first to discover the parabolic paths of comets. He made many valuable observations on a malignant fever in Sicily, and wrote a treatise on the causes of such fevers. He wrote also an account of an eruption of Etna, and a number of works on subjects of applied mathematics, of which the most celebrated is that *De Motu Animalium* (Rome, 1680–81). In this work, he applies the laws of mechanics to the motions of animals, regarding the bones as levers, in which the power acts between the weight and the fulcrum, and endeavoring to calculate the power of muscles from a consideration of their fibrous structure, and the manner in which they are united to the tendons. All more recent authors on the same subject have been much indebted to Borelli.

BORER, a name common to many insects of the Linnæan genus *ptinus*, the tribe *ptinores* of Latreille, coleopterous (q.v.) insects of small size, the larvæ of which—small, white, soft, worm-like creatures, with six minute feet—are furnished with strong cutting jaws (*maxillæ*), by means of which they eat their way in old wood, and similar substances, boring little holes as round as if made with a fine drill. Every one is familiar with the appearance of these holes, and with the injury done by these insects to furniture, etc. The holes are filled up, as the insect works its way onward, with a fine powder, formed from the wood which it has eaten; and finally it constructs for itself a little silky cocoon, and having passed through the pupa state in the bottom of its hole, comes forth a winged insect—a small beetle, in the widest popular sense of that term. One of the most common British species is *anobium striatum*, a dark-brown insect, not much above one line in length. The thorax, as in the whole tribe, is proportionately very large, and has a swollen hood-like appearance, the head being, as it were, received within it. This insect has long been noted for the pertinacity with which it stimulates death. This instinct appears to be common to the whole tribe, as it is also to many other insects. —Another species of the same genus, *anobium tessellatum*, has become an object of interest as one of the insects which, being sometimes heard to make a peculiar ticking noise, are connected with superstitious fancies and fears, and receive the name of death-watch (q.v.).

BORGET'TO, a t. of Sicily, in the province of Palermo, and 13 m. w.s.w. from Palermo. It is a long straggling town, of mean houses, but picturesquely situated on a wooded cliff overhanging a plain, and itself overhung by a lofty precipice of red rock. Pop. 6000.

BORGHE'SE, a family of great distinction in the republic of Siena, and afterwards at Rome. Camillo B. ascended the papal throne in 1605 as Paul V., and by him other members of the family were advanced to high positions. A marriage with the heiress of the family of Aldobrandini brought the B. family into the possession of great wealth. Camillo Filippo Ludovico B., prince B., born at Rome in 1775, joined the French army when it invaded Italy; and in 1803 married Pauline, the sister of Napoleon Bonaparte, and widow of gen. Leclerc. His wife subsequently received the principality of Guastalla, and he was created duke of Guastalla, and under the French empire he was for some time gov.gen. of the provinces beyond the Alps. He held his court at Turin, and was very popular among the Piedmontese. He sold the B. collection of artistic treasures to Napoleon for 13,000,000 francs, receiving in part-payment the Piedmontese national domains; but when these were reclaimed by the king of Sardinia in 1815, he received back some of the works of ancient art. After the overthrow of Napoleon, he separated from his wife, and broke off all connection with the Bonaparte family. He lost Guastalla, but retained the principalities of Sulmona and Rossano, his hereditary possessions. He died in 1832.—The *Borghese palace* is one of the most magnificent at Rome. The noble portico of the inner court is composed of 96 granite columns; the collection of paintings is remarkably fine.

BORGHE'SI, Bartolommeo, Count, a distinguished antiquarian, b. at Savignano, central Italy, on the 11th July, 1781. His father, Pietro Borghesi, who was one of the most accomplished scholars of his time, trained him to an early delight in learned pursuits. He studied at Bologna, and afterwards devoted himself to archæological researches. He arranged the numismatic collection in Milan, and that of the Vatican, of which he drew up a catalogue. In 1821, he fixed his residence in the republic of San Marino, where he died in 1860. The French government undertook the publication of his works, of which 7 vols. appeared in 1862–71. His principal work is his *Nuovi Frammenti Dei Fasti Consolari Capitolini Illustrati* (2 vols., Milan, 1818–20). His contributions to Forcellini's Latin lexicon are very highly prized.

BORGI, Giovanni, 1736–1802; a mechanic of small means in Rome, who was the founder of a ragged school in that city. After his death the school was sustained and enlarged, and especially supported by Pius VII.

BORGIA, a family originally Spanish, but which acquired great eminence in Italy after the elevation of Alfonso Borgia to the popedom, as Calixtus III., in 1455. He had previously been a privy-councilor of the king of Aragon. He died in 1458.—Rodrigo B. ascended the papal throne in Aug., 1492, under the name of Alexander VI. (q.v.).

Before his elevation to the popedom, he had a number of children by a Roman woman named Vanozza (Giovanna de' Catanei), of whom two, Cesare and Lucrezia, share their father's extraordinary historic infamy.—CESARE or CÆSAR B. was one of the greatest monsters of a time of depravity, when the court of Rome was the scene of all the worst forms of crime. He unscrupulously made use of the most sacred things as means to the most iniquitous ends. He had early received high ecclesiastical preferment, and his father, soon after becoming pope, invested him with the purple. But his father conferring upon his brother Giovanni the duchy of Benevento, with the counties of Terracina and Pontecorvo, Cæsar, as was believed, moved with envy, caused his brother to be assassinated. He obtained the duchy and counties for himself, and was permitted by his father to resign the purple and to devote himself to the profession of arms. He was sent in 1498 to France, to convey to Louis XII. a bull of divorce and dispensation from his marriage with Anne of Brittany. Louis rewarded him for the pope's complaisance with the duchy of Valentinois, a body-guard of 100 men, 20,000 livres of yearly revenue, and a promise of support in his schemes of ambition. In 1499, Cæsar married a daughter of the king of Navarre; and accompanied Louis XII. to Italy, where he undertook the conquest of the Romagna for the holy see. The rightful lords of that country, who fell into his hands, were murdered, notwithstanding that their lives had been guaranteed by his oath. In 1501, he was named by his father, duke of Romagna. In the same year he wrested the principality of Piombino from Jacopo D'Appiano, but failed in an attempt to acquire Bologna and Florence. He took Camerino, and caused Giulio Di Varano, the lord of that town, to be strangled along with his two sons. By treachery as much as by violence he made himself master of the duchy of Urbino. A league of Italian princes was formed to resist him, but he kept them in awe by a body of Swiss troops, till he succeeded in winning some of them over by advantageous offers, employed them against the others, and then treacherously murdered them on the day of the victory, 31st Dec., 1502, at Sinigaglia. He now seized their possessions, and saw no obstacle in the way of his being made king of Romagna, of the March, and of Umbria, when, on 17th Aug., 1503, his father died, probably of poison which he had prepared for twelve cardinals. Cæsar, also, who was a party to the design (and who, like his father, had long been familiar with that mode of dispatching those who stood in the way of his ambition, or whose wealth he desired to obtain), had himself partaken of the poison, and the consequence was a severe illness, exactly at a time when the utmost activity and presence of mind were requisite for his affairs. Enemies rose against him on all hands, and one of the most inveterate of them ascended the papal throne as Julius II. Cæsar was arrested and conveyed to the castle of Medina Del Campo, in Spain, where he lay imprisoned for two years. At length he contrived to make his escape to the king of Navarre, whom he accompanied in the war against Castile, and was killed on the 12th Mar., 1507, by a missile from the castle of Biano. With all his baseness and cruelty, B. was temperate and sober. He loved and patronized learning, and possessed in a remarkable degree a ready and persuasive eloquence. Machiavelli has delineated his character in his *Principe*.—LUCREZIA B. was a woman of great beauty. She was married first to Giovanni Sforza, lord of Pesaro, but this marriage was dissolved by the pope. She was said, without ground, to have lived in incest with her brothers and father. She next married in 1498, Alfonso, duke of Bisceglie, a natural son of Alfonso II. of Naples; but he was assassinated by her brother Cæsar in 1501. In Sept. of the same year, she married Alfonso of Este, who afterwards inherited the duchy of Ferrara. She died in 1520. Like her brother Cæsar, she shrank from no crime; but she also was a patroness of art and learning, and was therefore adulated by several poets. See Gregorovius, *Lucrezia B.* (1874).

BORGIA, LUCREZIA (*ante*), a greatly slandered woman, commonly supposed guilty of the most detestable sins. Modern research has tended to clear her of the charge of incest, so long believed, but of which the proof is entirely lacking. She was a woman of little strength of mind, and doubtless lacked the disposition to oppose the crimes of her father and her brother Cæsar; but after her marriage with the son of the duke of Ferrara she passed a quiet and prosperous life, and won universal respect by prudence, piety, and patronage of letters and art, dying in 1520.

BORGNE, LAKE, not exactly a lake, but an arm of the gulf of Mexico stretching into s.e. Louisiana, sometimes called Mississippi sound. The Rigolet pass connects it with lake Ponchartrain. It is about 60 m. long by 25 wide.

BORGO, a name given to a number of towns and villages in Italy and southern Tyrol, and indicating the growth of the town or village around a castle or castellated rock, the original Borgo. See BOROUGH. Thus, *B. di val Sugana* is a place of (1869) 4092 inhabitants, with a castellated hill, in Tyrol; *B. Lavezzaro* is an Italian t. in the province of Novara, with about 3000 inhabitants; *B. San Donnino*, in the province of Parma, with 6000 inhabitants; *B. San Sepolchro*, in the province of Arezzo, with 8000 inhabitants, etc.

BORGOMANE'RO, a t. of n. Italy, in the province of Novara, and 19 m. n.n.w. from Novara, situated near the left bank of the Agogna. It is a walled town, well built, and contains a communal college and a hospital. It has little trade. Pop. 5320.

BORGO SAN DONI'NO, a city of n. Italy, in the province of Parma, situated in a plain, 14 m. n.w. from Parma, on the railway between Parma and Piacenza. It is sur-

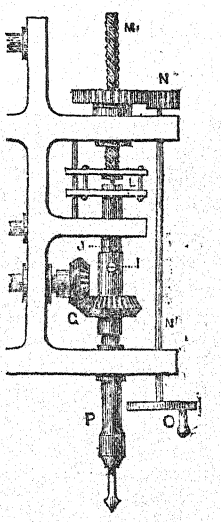
rounded by walls, has several good streets, is an episcopal see, and has a cathedral (the oldest part of which is in the Lombard style), several churches, and several educational institutions. Manufactures of silken, linen, and woolen fabrics are carried on; and oil and wine are produced in considerable quantities. The city derives its name from a saint, who is said to have been a soldier in the army of the emperor Maximian, and to have suffered martyrdom here. The shrine of St. Donino has long been one of the most frequented in Italy. There are some curious remains of very rude mediæval sculpture in the cathedral. Pop. about 4200.

BORGOTA'RO, a t. of n. Italy, in the province of Parma, and 35 m. s.w. from Parma, on the left bank of the Taro, a tributary of the Po. It is encircled by walls, and is well built. Pop. (including commune) 6938. The surrounding district is hilly and wooded.

BORGU, or BARBA; a large district in w. Africa, along the w. side of the Niger and n.e. of Dahomey. The surface is generally level, and the soil fertile and tolerably well cultivated, producing corn, yams, plantains, and limes abundantly. Cattle of good breed are numerous, and there is plenty of game. The people are honest, peaceful, and good-humored. B. is divided into a number of states, of which the smaller are dependent on the Fellatah kingdom of Gondo, while the state of Kitti is ruled by an independent and powerful chief who is sometimes spoken of as sultan of Borgu. The important cities are Wawa and Kiama. B. was the scene of the disastrous fate of Mungo Park, in 1805.

BORIC ACID. See BORACIC ACID, *ante*.

BORING, as a process in carpentry and in the working of metals, is performed in a variety of ways. For B. holes in wood the carpenter makes use of *awls*, which simply displace a portion of the wood, and of *gimlets*, *augers*, and *bits* of various kinds, these last being applied by means of the crank-shaped instrument called a *brace*. All these are too familiar to need description. The B. of holes in metal plates for making attachments, is effected by means of *drills* driven by machinery. The annexed figure shows the essential parts of such a B. machine. The drill is inserted in the end of a vertical spindle, P, which revolves in a fixed frame, and is driven by the bevel-wheels, G. The metal to be bored is placed on a table or other support below the drill; and the up and down motion, or end-pressure and off-action, of the drill is effected by the hand-gear, O, N, turning the screw M, which, being coupled to the top of the spindle at L, presses it down or raises it, according to the way it is turned. The spindle slides vertically in the collar forming the axis of the bevel wheel, but is carried round with it by means of the pin I, which projects into a groove seen at J.



Boring Machine.

The B. of cannon and of cylinders for steam-engines is most conveniently described under CANNON-FOUNDING; see also LATHE.

BORING, applied to the earth and to rocks, has two chief uses. 1. *For draining.*—In some districts, owing to the existence, near the surface, of a bed of clay impervious to water, the surface-water is retained in hollows, of greater or less extent. The expense of deep draining has been so great as to induce proprietors to neglect such land, but this expense has lately been avoided by leading drains to the lowest portion of the hollow, and then opening a bore through the clay to the pervious strata of sand or gravel beneath. This is done by a simple instrument, an auger of 2½ or 3½ inches in diameter, wrought by means of a cross-bar by one or two men.

2. *For artesian wells and for the discovery of the mineral contents of the earth.*—As the borings for these purposes are performed in the same manner, it is unnecessary to give them separate notices. The object of B. for artesian wells is to open a passage for the escape of water from water-logged strata. See ARTESIAN WELLS. In the search for minerals, B. is had recourse to as a cheap method of discovering the mineral wealth of a district, and whether the quantity and quality of the contained minerals are such as to make the working remunerative. It should, however, never be undertaken without a previous geological survey of the locality; the neglect of this has caused an immense loss of time and money in futile searches for minerals, as in the innumerable cases of bores driven into Silurian and old red sandstone strata, in search for coal. B. is also of use even after the presence of coal has been ascertained, to determine the most advantageous position for sinking the shaft by which the coal is to be drawn up. The general method of operating is as follows: The boring-instrument consists of an iron shank, having a cross-bar at the top and a hollow screw at the bottom; to this all the successive boring-instruments are fastened. A simple chisel is at first attached to the screw, and one or two men press upon the cross-bar, and at the same time force it round like an auger, while another workman, by means of a lever erected overhead, with a chain descending from it to the cross-bar, gives an up and down motion to the instrument. When the chisel becomes clogged, from the accumulation of material which it has loosened, it is exchanged for a cylindrical auger, provided with a valve, which scoops

out the separated material; and thus by alternate chopping and scooping the work is carried on. The nature of the strata is determined with considerable facility and certainty by examining the fragments brought up by the auger. As the work advances, successive lengths of rod are screwed on at the upper end. Three poles are erected over the well, for the purpose of elevating the rods, to permit the change of the tools.

The cost of B. varies with the material through which the operation is carried on. In strata of moderate hardness, the cost is about 10*s.* a fathom for the first 10 fathoms, and an additional 6*s.* for each 5 fathoms beyond.

A simple method of B. has been long in use among the Chinese, by which the great loss of time, arising from the screwing and unscrewing the rods, at each elevation of the chisel or auger, is saved. The chisel and scooping instrument are fastened to a rope, which is alternately elevated and allowed to descend by the simple force of gravity; the instrument thus forces its way through the ground. In the softer rocks of the newer formations this method has been successfully employed in B. for artesian wells.

A still greater saving in time and money has been obtained by a process invented by M. Fauvelle, and described by him before the British association in 1846. His apparatus consists of a hollow boring-rod, formed of wrought-iron tubes screwed end to end, armed at the lower end with a hollow perforating tool. The upper end of the hollow rod is connected with a force-pump by a flexible tube. By means of the force-pump a current of water is sent down the rod into the bore-hole as it is sunk, and the water coming up again brings with it all the drilled particles, so that, except for the renewal of the perforating tool, the rods do not require to be elevated. M. Fauvelle found, by experience, that when he was passing through gravel, or required to bring up considerable masses of broken-off rock, it was better to inject the water by the bore-hole and let it rise through the hollow tube. In this way he has succeeded in raising stones 2¼ in. long by 1¼ in. thick. For B. in tunnels, see TUNNEL.

BORIS'OV, a t. of Russia, on the Beresina, 44 m. n.e. of Minsk, near the place where Bonaparte's army crossed the river Borisov about the end of Nov., 1812. Pop. '67, 5233.

BORISSOGLIEBSK', a t. in Russia. 11½ m. s.e. from Jamboff, on the left bank of the Vorona, in 51° 22′ n., 41° 4′ east. B. was founded in 1646 for defense of the frontiers against the incursions of the Crim Tartars. It has an important trade in grain, wool, cattle, and leather, some manufactures, and two annual fairs. Pop. '67, 12,254.

BÖRKU, or BORGU, a country in the interior of Africa, between 17° and 20° n., and 18° and 21° e., forming a part of the great Soudan region. The climate is better than that of the surrounding countries, but the eastern trade-winds blow with great violence from early morning until about 3 P.M., drifting the loose sands into countless heaps, and changing their shape and position from day to day. A great part of the district was not long ago under water. The irrigated lands raise dates in abundance, of a dozen kinds. The northern valleys have a settled population of about 5000, known as the Donosa, or Dosa people; the other inhabitants and traders are nomadic. Dr. Nachtigal spent some time in B. in 1871.

BORLASE, Rev. WILLIAM, an English antiquarian, was born at Pendeen, Cornwall, Feb. 2, 1696. Ordained a priest in the English church in 1720, he was, in 1732, presented to the vicarage of his native parish of St. Just. Devoting himself to a study of the natural history and antiquities of Cornwall, he in 1753 published, at the Oxford press, a volume entitled *Observations on the Antiquities, Historical and Monumental, of the County of Cornwall.* This was followed, in 1758, by the *Natural History of Cornwall*, printed at the same press. B. paraphrased the book of Job, and wrote several pieces of a religious nature; was active in the supervision of his parish, and took an especial interest in the improvement of its highways. But that which makes his name most interesting now, is the fact that he was one of Pope's correspondents, and furnished to the poet most of the curious fossils of which the Twickenham grotto was composed. He died Aug. 31, 1772.

BORN, BERTRAND DE, d. about 1209; a French soldier and troubadour, of a family descended from the dukes of Aquitaine. He had a contest with his brother for the possession of the family heritage, and defeated him; but Richard cœur de lion took the side of the brother because B. had satirized the "lion-hearted" in certain songs. B. then favored Henry II. of England, and took part in the bitter political quarrels of the period. After Richard's death he seems to have led a quiet life; but that his songs had great influence is evident from the fact that Dante put him in the *Inferno* as wickedly inducing the young king to quarrel with his father; and historians refer to the influence of his songs and his deeds of arms as embittering the quarrels of the time.

BORN, IGNATIUS, Baron von; 1742–91; a Transylvanian mineralogist, educated in a Jesuit college; studied law at Prague; traveled in w. Europe, and then went into the department of mines and the mint at Prague in 1770. Against much opposition B. succeeded in substituting amalgamation for smelting and cupellation for extracting silver from the ores in the mines of Hungary. In 1766, Maria Theresa appointed him to arrange the imperial museum at Vienna, and soon afterwards he was made a councilor of state. B. took an active part in the political affairs of Hungary.

BORNA, a t. in Saxony, 16 m. s.s.e. from Leipsic; pop. '71, 5751. Here are ruins of an old castle destroyed by the followers of Huss in 1430.

BÖR'NE, LUDWIG; 1786–1837; a German political writer and satirist. He was the son of Jakob Baruch, a Jewish banker, but renounced the Hebrew faith and changed his name to Börne, by which only he is known. He was the editor of various journals which were successively suppressed by the government on account of their extreme liberalism. The one best remembered is *Der Wage*, in which B. had some powerful and sarcastic dramatic criticisms. His last literary venture was *La Balance*, published in Paris just after the revolution of 1830, in which he mercilessly satirized the German dynasty, which he looked upon as the great opponent of liberalism.

BOR'NEENE, FLUID BORNEO CAMPHOR, or OIL OF CAMPHOR, is a thin liquid, lighter than water, with a fragrant odor (somewhat resembling turpentine), obtained by distilling native oil of Borneo camphor, or oil of Valerian. The Borneene is employed in perfumery.

BOR'NEO (called by the natives *Pulo Kalamantin* or *Klemantin*, which is the name of an indigenous fruit), next to Australia and Papua, the largest island in the world, is situated in the Indian archipelago, in 7° n. to 4° 20′ s. lat., and 106° 40′ to 116° 46′ e. long. It is bounded on the e. by the sea of Celebes and the Macassar strait, s. by the sea of Java, w. and n. by the gulf of Siam and the China sea. Its length is about 800 m., with a breadth of 700, and an area of about 300,000 sq. miles. The pop. is under 2,000,000. The largest part, ruled by the Dutch, had, in 1873, 457 Europeans and 1,235,187 natives; the independent kingdom of Borneo or Brunaï, in the n., between Sambas and Maludu, 225,000; Sarawak, 50,000; and the unexplored regions of the interior are sparsely peopled. The coasts of B., which are often low and marshy, and rendered dangerous to navigation by numerous islets and rocks, present no deep indentations, though they are pierced by numerous small bays and creeks. Two chains of mountains run through the island in a nearly parallel direction from s.w. to n.e.; the one rising in Sarawak (q.v.) gradually increases in elevation until it attains, in its termination in Mt. Kini Balu, on the n.e. coast, a height of 13,698 ft.; a cross chain, branching off in about lat. 2° n., extends in a s.e. direction through Banjermassin (q.v.). The other range, which is much lower, intersects the equator in long. 113° e. Between are well-watered plains. B. has fine rivers, especially on the n. and w. coasts. About their upper courses, however, little is known. The principal are: on the n., the Brunaï or Borneo, the Redjang, Baram, Bintulu, Sirabas, Batang-Lupar, and Sarawak; on the e., the Kuteï or Mahakkan, Balungan and Kuran, or Beru. The Barito, or river of Banjermassin, Kahaijan, Kapuas-Murung, Mendawei, Sampit, and other smaller streams, flow through the s.e. part; while the Pontianak, or Kapuas-Pohang, Sambas, Simpang, Succadana, and Pawan, are the most important on the west. All the rivers of B. have banks at their mouths, which render them unfit for large ships; the Brunaï however, is navigable 15 m. for vessels of considerable tonnage. There are numerous lakes, abounding in fish, the largest being Kini Balu, at the foot of the mountain of the same name, 100 m. in circumference, beautified with islands, and having many Dyak villages on its bank. The climate, in the low grounds, is humid, hot, and unhealthy for Europeans; but in the higher parts towards the n. the temperature is generally moderate, the thermometer at noon varying from 31° to 91° F. During the rainy season, from Nov. to May, heavy storms of wind and loud thunder are experienced on the w. coast. Vegetation is extremely luxuriant. The forests produce iron-wood, teak, gutta-percha, ebony, sandal-wood, rattans, dye-woods, benzoin, wax, dragon's blood, sago, various resins, vegetable oils, and gums. The camphor is the best in Asia, of which 4500 lbs. are exported annually. The mohor tree, well adapted for making native boats, attains a height of 80 ft., and the Kaladang, suited for large masts, to 200. Nutmegs, cloves, cinnamon, pepper, betel, ginger, rice, millet, sweet potatoes, yams, cotton, sugar-cane, indigo, tobacco, coffee, melons, citrons, pine-apples, bananas, cocoa-nuts, etc., are largely grown. The mountains and forests contain many monkeys, among which is the orang-outang. Tapirs, tigers, bears, swine, wild oxen, and various kinds of deer abound. The elephant is only found on the n. coast, and the rhinoceros on the n.w. The few domesticated animals are buffaloes, sheep, goats, dogs, and cats. A few horses are seen in Banjermassin. The birds are remarkable for their plumage. The principal are eagles, vultures, Argus-pheasants, peacocks, flamingoes, pigeons, parrots, and the swallows (*collocalia esculenta*) which construct the edible nests prized by the Chinese for making soup. The rivers, lakes, and lagoons swarm with crocodiles, and many kinds of snakes, frogs, lizards, and leeches. Fish is plentiful, and the coasts are rich in tortoises, pearl-mussels, oysters, and bêche-de-mer, or trepang. Brilliant butterflies and moths are in great variety, and silk worms are found. Among the mineral products are coal, gold, antimony, iron, tin, platina, nickel, diamonds, precious stones, rock-crystals, porcelain-clay, petroleum, and sulphur. The diamond mines are chiefly in Landak and Pontianak (q.v.). Sambas produces the greatest quantity of gold; the kingdom of Brunaï, Kuteï, and Banjermassin, the largest amount of coal.

The population consists of three classes: the Dyaks, who are the aboriginal inhabitants, and almost all heathen; the Mohammedans or Malays, Buginese, Javans, and Arabs; and the Chinese. The Dyaks live chiefly in the interior, and employ themselves

with land culture, collecting gutta-percha, resin, gums, rattans, gold-dust, and wax. They are divided into numerous tribes. The Malays dwell on the coasts, are traders, and bold sailors. They are more civilized than the Dyaks, cultivate the grounds around their houses, lay out gardens, keep cattle, and live partly by fishing. The Chinese, chiefly from Canton, have penetrated far into the interior. They engage in trade and mining, are unwearied in their efforts to make money, and then return to their native country. They number about 75,000, and have always endeavored to live as an independent republic, under chiefs chosen by themselves, and according to Chinese laws. In 1857, the Chinese living in Sarawak (q.v.) rebelled against sir James Brooke (q.v.), and were nearly exterminated. In the last years, the Dutch were also compelled to put them down by force of arms, and have imposed a poll-tax.

The women of B., except the Dyak, weave cotton fabrics, make earthenware, baskets, and mats of beautiful designs and colors. In the district of Banjermassin are factories of weapons. The principal exports are gold, gold-dust, diamonds, coal, rattans, gutta-percha, edible nests, cotton, wax, timber, dye-woods, mats, resins, sandal-wood, camphor, etc.; the imports—earthenware, iron, steel, and copper work, piece goods, yarns, woolen and silk fabrics, medicines, provisions, wines, spirits, rice, sugar, tea, tobacco, opium, trepang, gambier, vegetable oils, gunpowder, etc. In 1872, the Dutch imports amounted to £411,238, and the exports to £299,210.

By far the largest part of the island is ruled directly or indirectly by the Dutch, who have divided it into the residency of the western division of B., and that of the southern and eastern, the former having Pontianak (q.v.) as the seat of government; the latter, Banjermassin. The smaller portion towards the n. and n.e. contains Sarawak and the territories of the sultan of B. proper. Besides a number of small dependencies, the western division contains the important kingdoms of Landak, Mampawa, and Sambas, with the mining district of Montrado, in the north. The chief towns are Sambas (10,000), Pontianak (9000), Banjermassin (30,000), Borneo or Brunaï (30,000), and Sarawak (25,000).

The Portuguese effected a settlement in 1690 at Banjermassin; from whence they were, however, soon expelled. The Dutch succeeded in concluding a treaty of commerce with the princes of Banjermassin; and in 1643 erected a fort and factory, a second in 1778 at Pontianak, and others since. The British made unsuccessful attempts in 1702 and 1774 to effect a settlement in B.; but have, within the last twenty years, acquired a preponderating influence on the north-western coast. This has been in a great measure owing to the enterprise of sir James Brooke (q.v.) and his vigorous government as rajah of Sarawak, and in part also to the occupation of Labuan (q.v.) as a colony and naval station. The British government, however, refused, upon sir James Brooke's retirement from Sarawak, to annex it to the British empire. The piracy carried on by the inhabitants of B. has often demanded severe chastisement, and piratical flotillas have been destroyed by the British.

BORNEO, or BRUNAI, a seaport in n.w. Borneo, on the Brunai river, 10 m. from the ocean. It is built in the water, the houses standing on piles, and all the streets having canals in them. Pop. about 25,000.

BORN'HOLM, an island in the Baltic sea, belonging to Denmark, and situated about 90 miles e. from Seeland, and half-way between the island of Rügen and the Swedish coast, lat. 54° 59′ to 55° 18′ n., long. 14° 42′ to 15° 10′ east. Area, including three small islands in its vicinity, about 230 sq.m., with a pop. above 51,000. It is rocky, and traversed from n. to s. by a high mountain-ridge, the slope of which is in great part a waste heath, but elsewhere it is not unfertile, and agriculture and cattle husbandry are successfully prosecuted. High cliffs, sand-banks, and breakers make the coast dangerous. The most notable product of the island is porcelain clay, with which the porcelain manufacture of Copenhagen is carried on. The capital of the island is Rönne, or Rottum, on the western coast, a place of (1870) 5505 inhabitants.

BORNING-PIECE (Fr. *borner*, to bound), a common and very simple implement, used by gardeners in laying out grounds, to make the surface either level or of perfectly regular slope. It consists of two slips of board, one about 18 in. long, and the other about 4 ft., the shorter fastened by the middle to one end of the longer, and at right angles to it. One borning-piece being placed at one end of a line drawn in the piece of ground which is being laid out, with the edge of the shorter slip of board along the line, and the longer slip erect, others of the same size are similarly placed at the other end and in other parts of the line; and the requisite uniformity of surface is obtained by filling up with earth, or removing it, until on looking along their summits it appears that they are all in the same plane. The name is perhaps derived from the application of the implement to borders or edgings.

BOR'NU, a powerful state of Central Africa, extending between lat. 10° and 15° n., and long. 12° and 18° e., and bounded on the e. by Lake Tsad, s. by Mandara, w. by Hausa, and n. by Kanem and the Sahara. The greater part of the country is perfectly level, and much of it is liable to be overflowed in the rainy season, which lasts from Oct. to April, when fevers and other diseases consequently prevail. The heat from Mar. to June is excessive, ranging from 104° to 107° F. The two principal rivers are the Shary and the Yeou or Yo, both of which fall into lake Tsad. The soil is fertile,

and although the cultivation is very imperfect, produces plentiful crops of maize, millet, barley, rice, various kinds of pulse, cotton, and indigo. The inhabitants possess elephants, horses, buffaloes, oxen, sheep, etc. Wild beasts, as lions, panthers, etc., are very numerous, having their chief haunts in the forests which occur only in the vicinity of the rivers, and which abound also in birds of many kinds, snakes, crocodiles, etc. Wild bees are extremely plentiful. The country produces no iron, that which is used being brought from Mandara. Much care is bestowed upon the manufacture of coats of-mail, both for horses and their riders. The only other manufacture carried to any considerable extent is that of cotton cloth, which is dyed with beautiful blue stripes by means of indigo, and much exported to Fezzan. The population, which is estimated at about five millions, are mostly of negro race, and called Kanowry. The ruling race, called Shouas, are of Arab descent, and bigoted Mohammedans; but many traces of Fetishism remain among the masses. Whatever they have of civilization is derived from the Arabs. The slave-trade is eagerly prosecuted, and gives occasion to many warlike expeditions. B. appears to have existed as a state for many centuries, but in the beginning of the present century it was conquered by the Feilatahs, whose yoke, however, was soon shaken off, under the leadership of a fanatic faki, named Mohammed el Amin, whose services were called in by the sultan. On Mohammed's death, his son Omar became ruler of B. instead of the sultan. Dr. Nachtigal, who visited B. in 1870, describes it as rapidly decaying.

BORO BUDDOR (the great Buddha), the ruin of a splendid Buddhist temple in Java, residency Kadu, regency Magelang, and district Minoreh, near the junction of the Ello and Progo, is the most elaborate monument of the Buddhist style of architecture anywhere existing. Buddhism (q.v.) was early introduced into Java, and Javanese chronicles place the building of B. B. in the beginning of the 7th century. The figure (copied from Fergusson's *Handbook of Architecture*) represents a section through one half, and an elevation of the other half of the building. It is a pyramid of a square form, each side at the base measuring 600 ft., and consists of seven walls, which are built like the steps of a stair up a hill. Between the walls are narrow terraces running round the building. The walls are richly ornamented with statuary. Outside are niches, each of which is occupied by a statue of Buddha, larger than life, seated in the usual attitude, with his legs crossed under the body. The number of these figures is about 400. Between each of these are bass-reliefs, representing the god in the same attitude, besides architectural ornaments and carvings of all sorts. Below the niches, on the lower story, is an immense bass-relief running round the whole building, representing scenes from the life of Buddha, and religious subjects. The inner faces of the building are also profusely ornamented with bass-reliefs, seated figures, and architectural ornaments, carried to an extent unrivaled by any other building in the world. The art of sculpture appears in Java to have early attained the highest point of excellence. "Above and within the upper square terrace are three circular ones, the outer ornamented with 32, the next with 24, and the upper with 16 small domes, each containing a seated statue of Buddha, which can be seen through the open-work of their roofs. The whole is surmounted by what must be considered as the pagoda (q.v.) itself, which is now empty, its center being occupied only by a sunken chamber 10 ft. deep, meant originally, no doubt, to contain the relic for which this splendid temple was erected." Mr. Fergusson considers that the five lower terraces are copied from and represent a Buddhist vihara or monastery; and that the niches containing the cross-legged figures were, in the originals, cells, each occupied by a shaven priest. The structure is thus a compound of a tope (q.v.) with a copy in durable architecture, of the frail cells of a vihara.

BORODI'NO, a village of Russia, in the government of Moskwa, and about 70 m. w. from the city of that name. It is situated on the Kalouga, an affluent of the Moskwa, and gave name to the great battle fought between the French army under Napoleon, and the Russian under Kutusow, Barclay de Tolly, and Bagration, 7th Sept., 1812. The battle of B. was one of the most obstinately disputed in history, and the loss on both sides was almost equally great. Out of 240,000 men engaged, between 70,000 and 80,000 were killed and wounded. The Russians retreated on the following day, but it was in the most perfect order, and without the enemy venturing to attack them. The Russians, therefore, have always held this battle as a victory, and in 1839 raised a fine mausoleum on the battle-field. To the French, however, certainly belongs the honor, as they not only remained on the field of battle, but in seven days after they had pushed on to Moscow. The French name it the battle of the Moskwa, from the river of that name, and it gave marshal Ney his title of prince of Moskwa.

BOR'ON (symb. B, equiv. 11) is a non-metallic element present in boracic acid (q.v.) and borax (q.v.). It was discovered in 1808 by Gay Lussac and Thenard in France, and Davy in England. The process followed in procuring B. till lately was to mix pure and dry boracic acid (BO_3) with thin slices of the metal potassium (K), and heat them in a tube, when three atoms of the potassium abstracted the oxygen, forming potash (KO), and set free the boron (B). On cooling and washing the mixture with cold water, the potash dissolved out, and left the B. as a dark, greenish-brown powder, which, when heated, burned with a green flame, and was re-formed into boracic acid, by combining with the oxygen of the air. Recently, however, Wöhler and Deville have obtained B. by heat-

ing in a crucible at a high temperature a mixture of pure dry boracic acid and the metal aluminium, when the latter takes the oxygen forming alumina (Al_2O_3), and leaves the B. as minute crystals interspersed through the earth alumina. These crystals possess great interest from their similarity in properties to pure crystallized carbon, or the diamond, and they are now known among scientific chemists as *B. diamonds*. They are remarkably transparent, are tinged yellow or red (though the colors may be accidental, and rival the ordinary diamond in their luster and refractive power. B. diamonds not only scratch glass, but also the corundum and the sapphire; and a real diamond, with which a few B. diamonds were crushed, had its edges worn away. It is apparent, therefore, that the B. crystals possess in a high degree the characters of the ordinary diamond; and though they have as yet only been obtained in minute specks, yet it is not too much to expect that the size will be increased, and the artificial B. diamond come into the market as an article of ornament, to rival the *natural* carbon diamond in its mysterious power of flashing back the rays of light. Indeed, so like are these two kinds of diamonds, that they can scarcely be distinguished by outward characters or signs; and it has been gravely suggested that some of the diamonds which now adorn the brow, the neck, or the arm, may be natural B. diamonds. They are very indestructible, requiring a high temperature to destroy them; and, like the true diamond, heat ultimately forms them into a *coke*.

BOROUGH (Ang.-Sax. *byrig, burg, burh;* It. *borgo;* Fr. *bourg;* Scot. *burgh*). The original meaning of this word, by which we now designate a corporate township, seems to have been a hill, rising-ground, or heap of earth; and it was probably from the elevated positions on which places of defense were erected, that it afterwards came to signify a fortification or castle, and latterly the aggregate of houses, churches, and other structures, which, in unsettled times, usually gathered under the walls of a castle; together with their inhabitants, and the arrangements which were made for their government. The questions whether we owe our municipal corporations to Roman, or to Saxon and other Teutonic influences, or to both; and if to both, then to what extent they have severally contributed to their formation, have been keenly discussed by constitutional historians. In so far as etymology goes, its authority is pretty equally divided, the term *municipal*, from the Latin *municipalis*, and *city*, from *civitas*, favoring the Roman view; whilst B. from the root above indicated, and *town*, from the Saxon *tun* or *dun*, a fortified hill, support the Teutonic. But the discussion forms a branch of a very wide subject, which has divided recent writers into two opposite schools, and of which we can here only indicate the existence. On the Roman side, sir Francis Palgrave is the most uncompromising, and Mr. Allen, as it seems to us, the more judicious champion. The Teutonic side is espoused by most of the Anglo-Saxon scholars of England, and in general by German writers. But from whatever source derived, that the boroughs of England existed, not as aggregates of houses merely, but as corporate bodies, in the Saxon time, is now generally admitted. The B. system of Scotland is also of great antiquity. "A *Hanse*, or confederation of boroughs for mutual defense and the protection of trade, existed in Scotland, and was known by this name in the reign of David I., about a century before the formation of the Hanseatic league of the continental cities; and the famous burgh laws date from about the same period. This code of Scotch burghal regulation," in Mr. Innes's opinion, "though collected in the reign of David, and sanctioned by him, was the result of the experience of the towns of England and Scotland;" and he goes on to show the very close resemblance between these laws and the burghal usages of Newcastle, and even of Winchester, which seems to suggest their common Saxon origin. Mr. Innes speaks favorably of the B. life of our ancestors; and he considers the burgh domestic architecture, of which monuments remain sufficient to show that "the burgess of the reformation period lived in greater decency and comfort than the laird, though without the numerous following, which no doubt gave dignity if it diminished food. I am not sure that this class has gone on progressively, either in outward signs of comfort, or in education and accomplishment, equal to their neighbors. The reason, I suppose, is obvious. The Scotch burgher, when successful, does not set himself to better his condition and his family within the sphere of his success, but leaves it, and seeks what he deems a higher." In confirmation of this view, Mr. Innes elsewhere mentions that "many of the old citizen-merchants of Edinburgh had studied at the university, and appear in the list of graduates."

Borough, in England, is properly a city or other town that sends burgesses to parliament—a privilege, the nature and extent of which will be explained under parliament (q.v.); and in this sense it is also called a *parliamentary borough*. But in the interpretation clause of the municipal reform act, 5 and 6 Will. c. 76, s. 142, the word *borough* is declared, for the purposes of the act, to mean a city, borough, port, cinque port, or town corporate, and whether sending representatives to parliament or not. See MUNICIPALITY.

BOROUGHBRIDGE, a t. in West Riding, Yorkshire, on the right bank of the Ure, here navigable for small craft, 17 miles n.w. of York. It arose simultaneously with the decline of Aldborough, 1¼ m. to the e., soon after the conquest, when the great north road was diverted from Aldborough to this place. Its chief trade is in agricultural produce and hardware. Pop. '71, 2508. Edward II., in 1321, defeated the

earl of Lancaster here. Near B. are three immense Druid stones, called the "Devil's Arrows," 16 to 22 ft. high.

BOROUGH ENGLISH is a custom that prevails in some ancient boroughs in England, according to which the youngest son inherits the property within borough in preference to his elder brothers. The reason assigned for it is, that the youngest son, on account of his tender age, is not so capable as his elder brothers to maintain himself. A posthumous son is entitled to this privilege, and dispossesses his elder brother. The right of representation also exists with reference to it, for should the youngest son die in his father's lifetime leaving a daughter, she will inherit the property. This custom obtains in the manor of Lambeth, Surrey, in the manors of Hackney, St. John of Jerusalem in Islington, Heston, and Edmonton in Middlesex, and in other counties. See CUSTOM, GAVELKIND, INHERITANCE.

BOROUGH FUND. This is a fund which is expressly defined by the municipal corporations act, 5 and 6 Will. IV. c. 76, by which it is declared that the rents and profits of all hereditaments, and the interest, dividends, and annual proceeds of all moneys, dues, chattels, and valuable securities belonging or payable to any body corporate named in conjunction with a borough in the schedules, or to any member or officer thereof, in his corporate capacity, and every fine or penalty for every offense against this act (the application of which has not been already provided for), shall be paid to the treasurer of such borough; and all the moneys which he shall so receive shall be carried by him to the account of a fund to be called "The Borough Fund;" and such fund, subject to certain payments and deductions, shall be applied towards the payment of the salary of the mayor, and of the recorder, police magistrate, town-clerk, treasurer, and other officers. Corporations may now, under certain checks, maintain parliamentary and legal proceedings at the expense of the borough fund, 35 and 36 Vict. c. 91. But existing gas and water companies authorized by statute are not to be competed with in this way.

The court of chancery exercises jurisdiction over the property of corporations in boroughs, which, since the municipal corporations act, are considered to hold their property in trust for charitable uses; and the trusts are applicable as well to the personal as to the real estate. See Grant on *Corporations*, 1850; and see FUND.

BOROUGH JUSTICES were first created in the time of Charles I. Under the municipal corporations act, 5 and 6 Will. IV. c. 76, these justices consist of the mayor during his year of office, and for one year after it determines; the recorder *ex officio;* and such persons as the crown may appoint by commission. Their duties cannot be delegated; and before acting, they must make the same declaration, and take the same oaths as the recorder does on entering his office. See JUSTICES.

BOROUGH LAWS, in Scottish legal history, was the name given to a collection of ancient laws relative to boroughs or *burghs*, which have long ceased to have any force, but serve to throw light on the ancient manners and customs of the country. The authenticity of these B. L. is beyond question; they are universally allowed to have been enacted in the reign of king David in the 12th century. See REGIAM MAJESTATEM.

BOROUGH RATE is a rate raised and levied within borough by order of the council of the same; and it has been decided by the court of exchequer that such rate is valid, though not made *in public*. By the 92d section of the municipal corporations act, 5 and 6 Will. IV. c. 76, where there is a deficiency of the *borough fund* (q.v.), the borough council is authorized and required from time to time to order a B. R. in the nature of a *county rate* (q.v.) to be made within their borough, for which purpose the council shall have all the powers of county justices. As to boroughs not within the municipal corporations act, the levying and application of borough rates in them is regulated by the 17 and 18 Vict. c. 71, by the first section of which it is enacted that the justices of the peace may make a B. R. in the nature of a county rate, for all the purposes for which a B. R. may be levied, such borough justices also having the same powers as county justices. The council of a borough cannot make a *retrospective* rate; and the provision of the 7 Will. IV. and 1 Vict. c. 81, s. 2, which declared lawful all such retrospective rates as might be made within six calendar months after the passing of the act, was merely for a temporary purpose. The municipal corporations act directs that all sums levied in pursuance of a B. R. shall be paid over to account of the borough fund; and there is a provision as to *watch rates* (q.v.).

Where parties consider themselves aggrieved by a B. R., they may appeal to the recorder at the next quarter-sessions for the borough; or if there be no recorder, to the next county quarter-sessions.

BOROVIT'CHI, a t. of Russia, in the government of Novgorod, 98 m. e. of the town of Novgorod, on both sides of the river Msta, near some rapids. Pop. '67, 9108. Its situation on the great canal and river water-way which connects the Volga with lake Ladoga, renders it of considerable commercial importance.

BOROVSK', or BOROFSK', a t. of Russia, in the government of Kalouga, and 49 m. n.n.e. of the town of that name. Conjointly with Kalouga it gives title to a bishop. It has extensive manufactures of sail-cloth, and a trade in leather, flax, and hemp. Its

onions and garlic are celebrated. In its vicinity is a convent, founded in 1444, one of the richest in the empire. Pop. '67, 8326.

BORROME'AN ISLANDS, a group of small islands in the Lago Maggiore, northern Italy. They are situated in the western arm of the lake, called the bay of Tosa, and are named after the family of Borromeo, which for centuries has been in possession of the richest estates in the neighborhood. They are sometimes also called *Isole dei Conigli*, on account of the number of rabbits found on them. They were little more than naked rocks, till Vitaliano, count Borromeo, master-general of ordnance to the king of Spain, about 1671, caused soil to be carried to them, built terraces, and converted them into gardens, the beauty of which and of their situation has won for them the name of the *Enchanted Islands*. The two most celebrated are *Isola Bella* and *Isola Madre*. On the w. side of *Isola Bella* stands a palace of the Borromeo family, containing many admirable paintings and other works of art. The *Salle terrene*, a series of grottoes, inlaid with stones of various colors and adorned with fountains, connect the palace with the gardens, the terraced style of which gives to the whole island the appearance of a truncated pyramid; a colossal winged unicorn, the armorial device of the Borromeo family, crowning the whole. *Isola Madre* is laid out in the same terraced style, and is crowned by a castle. The odors of flowers from the islands, upon which grow many plants of tropical climates, are wafted far over the lake. The *Isola de' Pescatori* now contains a village of about 400 inhabitants, who derive their subsistence from fishing and smuggling.

BORROMEO, CARLO, Count, a saint of the church of Rome, was b. on the 2d Oct., 1538, at the castle of Arona, on the Lago Maggiore, the family seat of his ancestors. He studied law at Pavia, and took the degree of doctor in 1559. His uncle, pope Pius IV., on being raised to the pontificate in 1560, appointed him, notwithstanding his youth, to a number of high offices, and made him a cardinal and archbishop of Milan. B. displayed great faithfulness and ability in governing Ancona, Bologna, and other parts of the states of the church as legate; and in discharging the duties of offices connected with ecclesiastical administration at Rome. Surrounded as he was with magnificence and luxury, he was always grave, pious, and rigid in his life, studious, and a patron of letters. His uncle, the pope, made him his grand penitentiary, and did nothing considerable without his co-operation. It was in a great measure by his influence that the re-opening of the council of Trent was accomplished, and that its deliberations were brought to a conclusion so favorable to the papal throne. He committed its decrees to memory, had the principal part in drawing up the *Catechismus Romanus* for exposition of them, and proceeded to give all possible effect to them in his archiepiscopal province. B.'s exertions, not only for the improvement of ecclesiastical discipline, but also for the reformation of morals in the archbishopric of Milan, drew upon him the hostility of the monastic orders, and also to some extent that of the Spanish authorities in Milan, who were jealous of the extension of his jurisdiction. An attempt was even made upon his life in 1569. He spent great part of his income in beautifying the cathedral and other churches. With a view to provide well-qualified priests, he founded, in 1570, the Helvetic college at Milan. He brought about an alliance of the seven Catholic cantons, known as the *Golden Borromean League*, for the united defense of their faith. In the famine of 1570, and during the plague in Milan in 1576, he displayed equal energy, benevolence, and devotedness, saving the lives of multitudes by the prompt arrangements which he made for necessary relief. Exhausted by his labors and his austerities, he died on 3d Nov., 1584. Many supposed miracles at his tomb led to his being canonized in 1616. His theological works were published at Milan in 1747, in 5 vols. folio. On the western bank of the Lago Maggiore, in the neighborhood of his birthplace, is a colossal brazen statue of him. His brother's son, count Frederico Borromeo, born 1563, was also a cardinal, and from 1595 to 1631 archbishop of Milan, and was the founder of the Ambrosian library (q.v.).

BORROW, GEORGE, an English author, b. at Norfolk in 1803. He displayed from his earliest years an extraordinary talent for languages, and a strong inclination for adventure. In his youth he lived for some time among gypsies, by this means acquiring an exact knowledge of their language, manners, and customs. His travels, as agent for the British and foreign Bible society, through almost all countries of Europe and a part of Africa, made him familiar with many modern languages, even to their dialectic peculiarities. Whatever was little known had peculiar charms for him, and he shrunk neither from toil nor danger. True to his youthful predilection, he made the gypsies scattered over every part of Europe one of the principal subjects of his study. His first work, *The Zincali, or an Account of the Gypsies in Spain* (2 vols., Lond. 1841), made a favorable impression by its lively and dramatic style. It was followed by *The Bible in Spain* (2 vols., Lond. 1843), a book to which its author is chiefly indebted for his celebrity, and which consists of a narrative of personal adventures as various as it is interesting. The graphic power of the style amply compensates for the rather unmethodical arrangement of the book. After a long interval, B. published a work long before announced, *Lavengro, the Scholar, the Gypsy, and the Priest* (3 vols., Lond. 1851), which was generally regarded as an autobiography, with a spice of fancy mingling with fact. The principal character is depicted with extravagant exaggeration; and the somewhat bizarre originality which gave a peculiar zest to the author's earlier works here appears as man-

nerism. The book left the hero in the midst of his adventures, which were not continued until 1857, when B. published *The Romany Rye*, a sequel to *Lavengro*, which was a more unsatisfactory work than any of its predecessors. He published *Wild Wales* in 1862, and *Romano Lavo-Lil* in 1874.

BORROWING has, in the case of *money*, several legal applications of a general nature, in which the law with regard to *bonds*, *mortgages*, and other similar *securities*, has to be considered. See the articles on these subjects. More strictly, borrowing may be described as a contract under the law of *bailments* (see CONTRACT), and may be briefly and simply defined as asking or taking a loan. The essentials of this contract are, that there must be a certain specific thing lent, such as a book, an article of furniture, a horse, or it may be a house, land, or even an incorporeal right. But in the law of England the contract is confined to goods and chattels or personal property, and does not extend to real estate. Lord chief-justice Holt's definition described it as a borrowing of a thing *lent*, in contradistinction to a thing deposited, or sold, or intrusted to another for the sole benefit or purposes of the owner. Again, the borrowing must be gratuitous and for the borrower's use, which use must be the principal object, and not a mere accessory. Such use, too, may be for a limited time or for an indefinite period. The contract must also be of a legal nature, for if it is immoral, or against law, it is utterly void; this, however, is a necessary qualification of all contracts. Lastly, the property which is the subject of the contract must be borrowed or lent to be *specifically* returned to the lender at the determination of the agreement, in which respect it differs from a loan for consumption.

The persons who may borrow and lend are all those who can legally make a contract; a capacity, therefore, which excludes married women, unless they act with the consent of their husbands, when it binds the latter and not the wives.

It is not necessary that the lender should be absolute proprietor of the thing lent or borrowed; it is sufficient if he have either a qualified or a special property therein, or a lawful possession thereof. As to the borrower, he has the right to use the thing during the time and for the purpose intended, whether such intention is expressed or implied; but beyond this he cannot go. The following quotation from Mr. Justice Story's celebrated work on *bailments* (to which reference is generally made), is useful for popular information: "A gratuitous loan is to be considered as strictly personal, unless, from other circumstances, a different intention may fairly be presumed. Thus, if A lends B her jewels to wear, this will not authorize B to lend them to C to wear. So, if C lends D his horse to ride to Boston, this will not authorize D to allow E to ride the horse to Boston. But if a man lends his horses and carriage for a month to a friend for his use, there, a use by any of his family, or for family purposes, may be fairly presumed; although not a use for the benefit of mere strangers." During the period of the loan, the borrower has no property in the thing, but a mere right of possession and use of it. But, notwithstanding, if the thing lent and borrowed be injured by a stranger, it would appear that the borrower may maintain an action for the recovery of damages; the mere possession of property without title being sufficient against a wrong-doer. See CONTRACT, LOAN, HIRE, besides the subjects above referred to.

BORROWING DAYS. The last three days of March are so called in Scotland and some parts of England. The popular notion is, that these days are borrowed or taken from April, and may be expected to consist of cold or stormy weather. Although this notion dates from a period before the change of the style, a few days of broken and unpleasant weather about the end of Mar. still afford a sanction for old notions concerning the borrowing days. The origin of the term B. D. is lost in the mists of antiquity, though we are inclined to hazard the conjecture that it has no higher source than the popular rhyme in which it is introduced as a poetic fiction. The most dramatic form of this rhyme in Scotland is as follows:

March said to April:
"I see three hoggs on yonder hill;
And if you'll lend me days three,
I'll find a way to gar [make] them die!"
The first o' them was wind and weet,
The second o' them was snaw and sleet,
The third o' them was sic a freeze,
It froze the birds' feet to the trees.
But when the borrowed days were gane,
The three silly hoggs came hirplin [limping] hame.

The superstition, if we may so call it, respecting the B. D., though now little else than a jocular fancy, was so strong in Scotland in the 17th c., that when the Covenanting army, under Montrose, marched into Aberdeen on the 30th Mar., 1639, and was favored by good weather, a minister pointed it out in his sermon as a miraculous dispensation of Providence in behalf of the good cause. See Gordon of Rothiemay's *History of Scots Affairs from* 1637 *to* 1641. For further notice of the B. D. we refer to Brand's *Popular Antiquities*.

BORROWSTOUNNESS', or BONESS', a seaport in Linlithgowshire, on a low peninsula on the firth of Forth, 17 m. w.n.w. of Edinburgh. It has coal-mines extending under the bed of the firth; and manufactures of salt, soap, malt, vitriol, and earthenware, and a trade in grain. Ironstone, limestone, and freestone also exist in the parish. Graham's dike, a part of the Roman wall of Antoninus, traverses the parish. Dugald Stewart

lived near Borrowstounness. Pop. '71, 4986. In 1875, there were registered as belonging to B. 26 vessels of 3881 tons. In the same year, 993 vessels, of 123,595 tons, entered the port, and 2080, of 245,675 tons, cleared it.

BORSA, a village in Hungary, 50 m. s.e. of Szigeth; pop. '69, 5503. There are mines of gold, lead, and copper in the neighborhood.

BORSAD, a t. in the n. division of the province of Bombay, in the district of Kaira. It is situated in the elevated region of Gujerat, 1900 ft. above the sea level, and is connected by railway with Bombay and Baroda. Pop. '72, 12,214.

BORSIPPA, mentioned by Strabo as a city of Babylonia, sacred to Apollo and Diana, supposed to have been near Babylon. Recent writers have suggested that the mound Birs-Nimrod may be on the site of the old city, but this cannot be held as confirmed.

BORSOD, a co. in Hungary, on the Theiss; 1370 sq.m.; pop. '70, 195,037. The soil is productive, and the co. is famous for wheat and other grain, and for cattle. Grapes are extensively cultivated. There is considerable mining, and plenty of game. Co. seat, Miskolcz.

BORY DE SAINT VINCENT, JEAN BAPTISTE GEORGE MARIE, a French traveler and naturalist, was b. in 1780 at Agen, now in the department of Lot-et-Garonne. In 1798, he proceeded, along with capt. Baudin, in a scientific mission to New Holland, but separated from him before they reached their destination. On his return he wrote his *Essai sur les Iles Fortunées de l'antique Atlantide* (Par. 1803); and his *Voyage dans les quatre principales Iles des Mers d'Afrique* (Par. 1804). Having joined the army, he served at Ulm and Austerlitz, and on Soult's staff in Spain. He served as a col. at Waterloo, and afterwards had to retire to Belgium. At Brussels he edited, along with Van Mons, the *Annales des Sciences Physiques* (8 vols.). He also produced an admirable work on the subterranean quarries in the limestone hills near Maestricht (Par. 1821). He returned to France in 1820, wrote for liberal journals, and for Courtin's *Encyclopédie*, etc. In 1827, appeared his *L'Homme, Essai Zoologique sur le Genre humain*. He wrote what relates to cryptogamic plants in Duperrey's *Voyage autour du Monde* (Par. 1828). He rendered an important service to science by editing the *Dictionnaire Classique de l'Histoire Naturelle*. When, in 1829, the French government sent a scientific expedition to the Morea and the Cyclades, the first place in it was assigned to B. de S. V.; and the results of his researches were given to the world in the *Expédition Scientifique de Morée* (Par. and Strasb. 1832, etc.), and in the *Nouvelle Flore du Péloponnèse et des Cyclades* (Par. 1838). In 1839, he undertook the principal charge of the scientific commission which the French government sent to Algeria. He died 22d Dec., 1846.

BORYSTHENES. See DNIEPER, *ante*.

BORZ'NA, a t. of Russia, in the government of Tchernigov, 50 m. s.e. of the town of Tchernigov. Pop. '67, 8129.

BOS. See BOVIDÆ and OX.

BOS, LAMBERT, a Dutch philologist, was b. at Workum, in Friesland, 23d Nov., 1670, and studied at the university of Franeker, where, by the advice of Vitringa, he devoted himself especially to the Greek language. In 1704, he was appointed Greek professor in that university. He died 6th Jan., 1717. All his works are characterized by thorough scholarship and remarkable acuteness, and notwithstanding the advances of classical criticism since his day, some of them are still consulted, such as his *Vetus Testamentum ex Versione Septuaginta Interpretum* (Franeker, 1709; new edit., Oxford, 1805), his *Ellipses Græcæ* (Franeker, 1702), and more particularly his *Antiquitatum Græcarum præcipue Atticarum Descriptio Brevis* (Franeker, 1714).

BOSA, a t. of the island of Sardinia, in the province of Cagliari, near the mouth of the Termo. Lat. 40° 17′ n., long. 8° 27′ east. Notwithstanding its fine situation, partly on the side of a hill, and partly on a plain, it is an unhealthy place. It is surrounded by decaying walls; has an old castle, a cathedral, several monasteries and churches; and a trade in wine, oil, grain, and cheese. Its port admits only vessels of small size. Pop. 6500.

BOSC, LOUIS AUGUSTIN GUILLAUME, 1759–1828; a French naturalist who visited the United States in 1796 and practically studied American natural history. He traveled in Italy, wrote much on natural history, was professor in the Versailles zoological garden, and member of the academy. He was tutor to Mlle. Roland, and adopted her as his daughter, recovering for her the confiscated property of her family. He was the author of a history of the wine district of France, and several well-known works on natural history.

BOSCAN-ALMOGA'VER, JUAN, a Spanish poet, b. in the year 1500 at Barcelona, of an ancient noble family. He received from his parents a careful education, and came to Granada, to the court of Charles V. The education of the celebrated duke of Alva was afterwards intrusted to him. He spent the latter part of his life at Barcelona, and was employed in editing his own works and those of his friend Garcilasso de la Vega, when he died some time prior to 1544. He was the first to make use of Italian measures in Spanish verse, and thus became the creator of the Spanish sonnet. By the introduction

of various Italian forms, he made an epoch in Spanish poetry. His poems are still esteemed, but his other literary productions are forgotten. The best edition is that of Leon, 1549.

BOSCAW'EN, EDWARD, an eminent English admiral, second son of viscount Falmouth, was b. in 1711, and highly distinguished himself at the taking of Puerto-Bello, and at the siege of Carthagena in 1740. In April, 1744, he captured the French ship *Medée*, with 800 prisoners. He had an important share in the victory off cape Finisterre (May 3, 1747), and six months after received the command of the East Indian expedition; he displayed high military skill in conducting the retreat from Pondicherry. He returned in 1750, and in the following year became a lord of the admiralty. In 1755, he was again afloat, and intercepted the French fleet off Newfoundland, capturing two 64-gun ships and 1500 men, including the French commander, Hoquart, whom he had twice before taken prisoner. Next year, now admiral of the blue, he was appointed commander-in-chief of the powerful expedition against cape Breton, as the fruit of which that island and St. John's were taken after some hard fighting. B. crowned his career by his signal victory over the French Toulon fleet, in the bay of Lagos, Aug. 18, 1759. On his return home, he received the thanks of parliament, a pension of £3000 a year, a seat in the privy council, and the command of the marines. In the following summer, while his fleet lay idle in the bay of Quiberon, ravaged by scurvy, B. and some of his men employed themselves in cultivating a garden on a small island, in order to supply the sick with vegetables. He died in the following year. Lord Chatham is said to have testified that when he proposed expeditions to other commanders he heard only of difficulties, but when he applied to B., he found him ready with suggestions and expedients.

BOSCH, HIERONYMUS DE, b. at Amsterdam, 23d Mar., 1740, d. there 1st June, 1811; was unquestionably the most distinguished Latin poet of recent times, and a philologist of varied acquirements. His *Poemata* first appeared at Leyden in 1803 (2d ed. Utr. 1808). He rendered an important service to classical literature by his edition of the *Anthologia Græca*, with a metrical translation by Hugo Grotius, never before published (4 vols. Utr. 1795–1810, to which Van Lennep added a fifth volume, Utr. 1822). His discourses and treatises on subjects of literature, which are mostly composed in the Dutch language, display profound learning, excellent judgment, and refined taste.

BOSCH-BOK, an antelope of s. Africa, found chiefly in almost impenetrable thickets. It is timid, and easily caught in the open country, and its flesh is much valued. It is from 4 to 5 ft. long, and makes a sound like the barking of a dog.

BOSCH-VARK, a wild hog in s. Africa, nearly the same in form and habits as the domestic hog, but with long pointed ears and a long tail. These animals live in herds, and the boars make dangerous fight with their tusks.

BOSCOBEL, an extra-parochial liberty of England, in the co. of Shropshire, about 6 m. e.n.e. of Shiffnal. The population of B. is only about 20, but the place is interesting in connection with the escape of Charles II. after his defeat at Worcester, in 1651. After the battle, Boscobel house being proposed as a secure retreat, thitherwards Charles turned his steps. At White-Ladies, a seat of the Giffard family, which was reached in the early morning, the king had his long hair cut, his hands and face smeared with soot, and for his royal dress he substituted the green and greasy suit of a countryman, and a leathern doublet. Thus disguised, Charles passed through a secret door into a neighboring wood, in the thickest part of which he sat shivering in the rain until dusk, when he stole out, and along with a guide endeavored to reach Wales, where it was now thought he would be safer than at Boscobel. They reached a royalist's house at Madeley, on the banks of the Severn, at midnight, and it was then found that they could not escape to Wales, on account of the vigilance of the Puritans; and once more, after a day's rest in a stable loft, the king started for Boscobel wood, where he arrived about 5 o'clock in the morning. He immediately, along with maj. Carlis, who had led the forlorn hope at Worcester, ascended a thick pollard oak, from which they could watch at intervals during the day the roundheads in search of them passing by unaware of their near presence. In the evening they descended from their elevated hiding-place, and made their way to the manor-house, where the king remained hidden for two days. After other adventures, Charles contrived to escape from England on the 17th Oct.—The title of BOSCOBEL TRACTS has been given to certain contemporaneous writings, first published in 1662, giving a graphic description of this passage of the monarch's life. The authorship is generally attributed to Thomas Blount, a loyal gentleman of Worcestershire; but Nash, his grandson, in his history of Worcestershire, denies that they were his, on the authority of Blount himself. But the author, whoever he was, was manifestly a stanch royalist, and his narrative bears evidence that he had good opportunity for ascertaining the truth of all the statements in it.

BOSCO REALE, a t. of s. Italy, in the province of Naples, at the s. base of Mount Vesuvius, 10 m. e.s.e. of Naples city. It contains several churches and convents. Pop. 4553. Good wine is produced in the neighborhood, and much silk. This town was in imminent danger of destruction by the eruption of Vesuvius in 1850, when a stream of lava advanced towards it with a front of about a mile and a half broad, and a depth of

about 12 ft., enveloped the town, and consumed the wood on both sides of it, in which were many magnificent oak, ilex, and ash trees. The larger trees, as they were enveloped in the lava, poured out jets of hissing steam from every knot and branch, and then exploded with a loud noise, leaping into the air to the height of 10 or 20 feet.

BOSCO TRE-CASÈ, a t. of Italy, situated at the southern base of Mount Vesuvius. It has several churches and convents, and a royal manufactory of arms and gunpowder. Wine and silk are raised in the district. Pop. 2500.

BOSCOVICH, ROGER JOSEPH, a celebrated mathematician and astronomer, b. at Ragusa, 18th May, 1711. He entered at an early age into the order of the Jesuits, and spent his life in scientific pursuits and important public labors. Before the completion of his course of studies in Rome, he was appointed teacher of mathematics and philosophy in the *Collegium Romanum* there. The pope gave him a commission to measure a degree of the meridian in the states of the Church, which he accomplished in the years 1750-53. In 1764, he was appointed to a professorship in Pavia, but after some time retired from this office. He was subsequently appointed professor of astronomy and optics in the palatine schools at Milan, and superintended the erection of the observatory in the Brera college, upon which he spent money of his own. After the dissolution of his order, he went to Paris, in 1774, and received a pension from the king. B. afterwards went to Bassano, to superintend an edition of his works, on the completion of which he returned to Milan, but fell into a depression of spirits; which at last grew into complete insanity, and he died 12th Feb., 1787. His works include dissertations on a great variety of important questions in mathematical and physical science, and were published collectively under the title *Opera Pertinentia ad Opticam et Astronomiam* (5 vols., Bassano, 1785). His name is connected with a theory of physics, first published in his *Philosophiæ Naturalis Theoria, Redacta ad Unicam Legem Virium in Natura Existentium* (Vienna, 1758). He was also a poet, and his Latin poem *De Solis ac Lunæ Defectibus* (Lond. 1764), has been much admired.

BOSIO, FRANÇ. JOS., Baron, an eminent sculptor, was b. 1769, at Monaco, in Sardinia; studied at Paris; and when only 19, returned to Italy, where he executed a multitude of commissions even at that early age. His reputation was greatly increased by the figures which, at the request of Napoleon, he executed for the column in the Place Vendôme. Louis XVIII. and Charles X. also patronized B., the former appointing him royal sculptor, the latter elevating him to the rank of baron. He also enjoyed several professional honors, being director of the academy of fine arts in Paris, and member of the Berlin academy of arts. He d. July 29, '45. B.'s principal works are—the "Hercules" in the garden of the Tuileries; the incomparably beautiful "Hyacinth" in the Luxembourg; the "Nymph Salmacis," a figure displaying wonderful grace and purity of outline; an allegorical figure of France, 7 ft. high, surrounded by the muse of history and a group of genii; the statue in memory of the Duc d'Enghien; the equestrian statue in the Place des Victories, and the monument of count Demidov, 30 ft. high, composed of 6 figures, with bass-reliefs, etc. Besides these, B. executed a great multitude of busts of distinguished persons, such as the emperor Napoleon, the empress, queen Hortensia, the king and queen of Westphalia, Louis XVIII., Charles X., etc. B.'s works are all marked by grace of form, harmony of design, and elegance of finish. His style generally reminds one of Canova.

BOSJESMAN'S COUNTRY, a region in Africa to the n. of the Cape colony. The inhabitants, a variety of the Hottentot (q.v.) race, are remarkably diminutive in stature, and thoroughly savage in condition.

BOSNA-SERAI', SERA'IO, or SARAJE'WO (Ital. Seraglio), capital of the province of Bosnia, is beautifully situated in the midst of gardens on both sides of the Migliazza, an affluent of the Bosna, about 122 m. s.w. of Belgrade. Its pop. is estimated at 50,000, of whom the majority are Christian Bosniaks, the others Moslems and Jews. Four handsome stone bridges cross the river at different points of the city, which is adorned with many churches and mosques (among them a Christian cathedral), whose gilded domes and whitened minarets and spires give it quite an oriental appearance. B. has a palace built by Mohammed II., and an old castle on a height, erected in 1263 by the Hungarian gen. Cotroman; its old walls are decayed, and it is now of no military importance. B. has manufactures of tin, iron, and copper goods and trade in dyeing. Its position makes it an important commercial entrepot, and it is consequently a busy place. It has also valuable iron mines and mineral baths in the vicinity. The city was taken and occupied by the Austrians after a sharp engagement in Aug., 1878.

BOS'NIA, till 1878 a Turkish vilayet, now a province of the Ottoman empire occupied and administered by Austria. Till 1876 it also included Herzegovina (q.v.), and still comprises the hitherto Turkish parts of Croatia and Dalmatia. It is bounded n. by the Save and Unna; e. by the Vrina, the mountain chain of Jublanik, and a branch of the Argentaric Alps; s. by the Scardagh mountains; and on the w. by the mountains of Cosman, Timor, and Steriza. At a few points in the s. it reaches to the Adriatic sea. Area, 20,000 sq. miles. Pop. '79, near 1,000,000; about ¾ Christians, Moslems, and the rest Jews. With the exception of the northern tract, extending along the Save, it is everywhere a mountainous country, and is traversed by more or less elevated ranges of

the Dinaric Alps, whose highest peaks rise to a height of from 5000 to 7700 ft. above the sea, and are covered with snow from Sept. to June. The mountain slopes are for the most part thickly covered with forests of oak, beech, lime, chestnut, etc., of magnificent growth, and only here and there exhibit meadows, pastures, and cultivated spots. The principal river of the country is the Save, on the northern border, into which flow the Unna, the Verbas, the Bosna, and the Drin. The Narenta and the Boyana fall into the Adriatic sea. The air is salubrious, the climate temperate and mild. It is only in the plain that agriculture is carried on to a considerable extent; grain, maize, hemp, vegetables, fruits, and grapes are produced in great abundance; and their cultivation would be much more extensively and actively prosecuted but for the heavy impositions laid upon this branch of industry by the Turkish government. Game and fish abound, as well as wild animals, such as bears, wolves, lynxes, etc. The country is celebrated for the breeding of sheep, swine, goats, and poultry; and bees, both wild and tame, are very numerous. The gypsies and Morlacks dig for lead, quicksilver, coal, and iron; but beyond this, mining, owing to repressive government, is entirely neglected, although the country is rich in metallic ores. Commerce and manufactures—chiefly limited to the fabrication of fire-arms, saber-blades, and knives—are entirely confined to the towns. The position of B. gives it the transit trade between Austria and Turkey. It has almost no good roads. The population consists of Bosnians, Croats, Morlacks, Montenegrins, Turks, etc., the much greater part being of the Slavonian race. The Bosnians, or Bosniaks, who form about a third of the inhabitants, are partly Mohammedans (descendants of Slavonian Christians who changed their religion at the time of the Mohammedan conquest), and partly of the Greek and Roman Catholic churches. They are brave, hardy, rapacious, and cruel; rude and repulsive toward strangers, yet among themselves they are peaceful and honest; they are also industrious, simple in their habits, and temperate. The Moslem women in B. are less secluded than in the other Turkish provinces, and have long enjoyed the liberty of appearing in public more or less veiled. The Croats, who form about a sixth of the population, belong partly to the Greek and partly to the Roman Catholic church; only a few are Mohammedans. They are principally engaged in agriculture, the feeding of cattle, and the barter trade. The Morlaks, who number about 150,000, dwell mostly in the district of Herzegovina, and are courteous and clever in business. They are inveterate enemies of the Turks. Three fourths of them are Greek Christians, and the rest Roman Catholics. The Osmanli Turks in B. are but about 2000 in number; the number of Grecks and Jews is between 20,000 and 30,000. B. being a frontier province, is important as a line of defense, and has consequently a great number of fortifications. B., in ancient times, was included in Pannonia; and previous to the 7th c. was governed by princes of its own, called bans or woiwodes, who became dependent on Hungary. Being conquered by the Turks, it was finally annexed to the Ottoman empire in 1522. B. has frequently been the seat of political disturbance. A dangerous rebellion broke out in 1851. The insurrection which originated in Herzegovina in 1875, soon assumed the proportions of a national movement, and led to war between Turkey and Servia and Montenegro. The war of 1877–78 between Russia and Turkey followed; the treaty concluded at the close of it proposed to give B. administrative autonomy, but the Berlin conference of 1878 resolved that B. should be occupied and administered by Austria.

BOSPORUS, commonly but erroneously spelt *Bosphorus*, the ancient name of the channel which separates Europe from Asia, and connects the Black sea with the sea of Marmora. The name, which signifies ox-ford or cow-ford, was given to it because here, according to the legend, Io, transformed into a cow, swam across; or, as is very generally supposed, because it is so narrow that an ox might swim across. Afterwards, as the same name was bestowed upon other straits, this was designated the *Thracian Bosporus*. Its s. and n. entrances have two light-houses each. Its shores are elevated, and throughout its length the strait has seven bays or gulfs, with corresponding promontories on the opposite side. One of these gulfs forms the harbor of Constantinople, or, as it is often called, the Golden Horn. The length of the Thracian B. is about 17 m., with a breadth of from little more than a third of a mile to 2 miles. At the middle of this strait, where it it is about 2800 ft. in breadth, Darius made his bridge of boats when he marched against the Scythians. The B. has long been under Turkish control. Repeated European conferences, including that of Berlin in 1878, have confirmed the stipulation of the treaty made in 1841, providing that no ship of war belonging to any nation but Turkey shall pass the B. without the consent of the Ottoman authorities.

The name of CIMMERIAN BOSPORUS was given by the ancients to the strait of Kaffa (q.v.), also called the strait of Yenikalé or of Theodosia. The country on both sides of the Cimmerian B. formed, in ancient times, the kingdom of Bosporus, which was founded in 502 B.C. In 393, the kingdom was extended along the Asiatic coast; and Theodosia was united with it in 360. The kingdom became tributary to the Scythians in 290; and in the year 116 B.C., Mithridates, king of Pontus, vanquished the Scythians, and set his son, Machares, on the throne of Bosporus. On the death of Machares, soon followed by that of Mithridates, the Romans gave the country, in 63 B.C., to Pharnaces, the second son of Mithridates, and after his assassination, to several princes who gave themselves out for descendants of Mithridates. When at last the family became entirely

extinct in 259 A.D., the Sarmatians made themselves masters of the kingdom, from whom the inhabitants of the Chersonesus took it in 344. Along with Tauric Chersonesus, it after wards formed a part of the eastern Roman empire, until the Chazars, and afterwards the Tartars, under Mongolian princes, made themselves masters of it. See TAURIDA.

BOSQUE, a co. in n. Texas, on the Brazos, watered by Bosque river; 905 sq.m.; pop. '70, 4981—528 colored. It has an undulating surface, a fertile soil, with forests of oak and cedar. Co. seat, Meridian.

BOSQUET, PIERRE FRANÇOIS JOSEPH, a distinguished French marshal, b. 8th Nov., 1810, at Mont de Marsan, in the department of Landes, entered, in 1829, the polytechnic school at Paris, and in 1833 joined the artillery as sub-lieut. In June, 1834, he proceeded with his regiment to Algeria, where he became conspicuous for his military tact, energy, and valor. In 1847, he had attained the rank of col., and the following year he was named gen. of brigade by the republican government. In the end of 1853, he returned to France, and in 1854 was appointed by the emperor gen. of division. He had the command of the second division of the French army in the Crimea, and at the battle of the Alma, 20th Sept., his successful maneuvers against the Russian left wing were mentioned in marshal St. Arnaud's dispatch to the emperor as deciding the fate of the day. At Inkerman, 5th Nov., he contributed greatly to the defeat of the Russians. His conduct on this occasion was noticed with praise by lord Raglan in his dispatch, and the British parliament voted its thanks to him in a special resolution. He also took a leading part in the capture of the Malakoff, 8th Sept., 1855; but a wound he received from the bursting of a shell obliged him to retire to France. In 1856, he was made field-marshal. He died in 1861.

BOSS, in architecture, a raised ornament, covering the intersections of the ribs of ceilings. They are more frequently seen in vaulted roofs, as in the aisles of a church, but occur also where the ceiling is flat. In early Norman work there are generally no bosses, and they become richer and more frequent as we advance towards the decorated and perpendicular styles. In the decorated style the B. usually consists of foliage, sometimes combined with animals, heads, and the like. Coats-of-arms, charged with armorial bearings, came then also to be used for this purpose, though they were more frequent in the perpendicular.—The B. of a bit is the ornament with which a bridle-bit terminates at each end. It was borne in the arms of the corporation of Lorimers. See LORIMER.

BOSSAGE, a stone in a building left rough and projecting, afterwards to be worked into a decoration. Bossage is applied, in France, to rustic work in which stones advance beyond the general face or level of the structure.

BOSSI, GIUSEPPE; 1776–1816; an Italian painter and writer on art. He studied at Milan and at Rome, and was secretary of the Milan academy. When Napoleon was in Milan in 1805, B. exhibited a drawing of Michael Angelo's "Last Judgment," and pictures representing "Aurora and Night," "Œdipus and Creon," and the "Italian Parnassus." B. also made a copy of Leonardo's "Last Supper," the original being then almost obliterated, and from his copy a mosaic was executed by Raphael, and placed in the imperial gallery at Vienna. Another copy, made in oil, was placed in the Brera museum. Much of B.'s life was devoted to the study of the works of Leonardo, and his last work was a series of drawings representing incidents in the life of that master. He left unfinished a large cartoon in black chalk of "The Dead Christ in the Bosom of Mary, with John and the Magdalene." He also published a special volume on Leonardo, and other books on art. There is a monument by Canova to B.'s memory in the Ambrosian library.

BOSSI, GIUSEPPE CARLO AURELIO, Baron de, 1758–1823; an Italian diplomatist and poet. When only 18 years old, he published two tragedies, and at 22 became a doctor of laws. He served as secretary of state for foreign affairs, and in a diplomatic capacity in Berlin, St. Petersburg, and Venice. He was envoy to Bonaparte, member of the Sardinian provisional government, and deputy to petition for annexation to France. In 1801, Napoleon made him a baron and prefect of La Manche. Among his poems and lyrics is one entitled "Independenza Americana."

BOSSI, LUIGI, an Italian archæologist and historian, was born at Milan in Feb., 1875; studied at Pavia, and became a canon of the cathedral of Milan; but when the French entered Italy, he took the side of the invaders, and was appointed by Bonaparte agent of the French government at Turin, and afterwards prefect of the archives of the kingdom of Italy. He died at Milan 10th April, 1835. He was an extremely prolific author, and produced more than 80 works, great and small, including theological and religious works, dissertations on antiquarian subjects, historic works, works on subjects connected with the fine arts, tragedies, comedies, etc. That his works have afforded many opportunities for unfavorable criticism, is only what might be supposed, from their number and variety. His *Introduzione allo Studio delli Arti del Disegno*, is instructive and much esteemed. His most important historic works are a much enriched translation of *Roscoe's Life of Leo X.* (12 vols., Milan, 1816–17); *Researches concerning Christopher Columbus* (Milan, 1818); and a *History of Italy* (19 vols., Milan, 1819–23).

BOSSIER, a parish in n.w. Louisiana, on Red river; 800 sq.m.; pop. '80, 16,045—3505 colored; chief productions, corn and cotton. Co. seat, Bellevue.

BOSSU, RENE, LE, 1631–80; a French critic. He was professor in different religious houses for twelve years, but thenceforth he devoted his time to authorship. His first publication was on Aristotle's *Physics*. He afterwards wrote a *Treatise on the Epic Poem*, extravagantly praised by Boileau, in which he held that the subject should be chosen before the characters, and the action organized without reference to the persons who are to carry it on.

BOSSUET, JACQUES BÉNIGNE, a distinguished French pulpit orator, was b. 27th Sept., 1627, at Dijon; received his earlier education in the Jesuit college there; and then came to Paris to the college of Navarre, where he studied the sacred Scriptures, the works of classical antiquity, and the Cartesian philosophy. In 1652, he was made a doctor of the Sorbonne, and a canon in Metz. Here he was called by the bishop to reply to the catechism of the Protestant minister, Paul Ferri, and this he did in a way that commanded the admiration even of Protestants. He soon attained great distinction as a pulpit orator, and in 1661 he was made preacher to the court. His discourse on the occasion of marshal Turenne's conversion to the Catholic church obtained for him the bishopric of Cordan. The king having, in 1670, intrusted to him the education of the dauphin, he resigned his bishopric in 1671, because he believed that he would be unfaithful to his duty if he retained it during a continued absence from his diocese. He was now made a member of the academy. The care with which he attended to the education of the dauphin was rewarded, in 1680, by his nomination as first almoner of the dauphin, and in 1681 by his appointment to the bishopric of Meaux. He was the author of the four articles which secured the freedom of the Gallican church, and the rights of the king in regard to it, against the aggressions of the pope; and his eloquence in the assembly of the French clergy, in the year 1682, obtained their adoption of these articles. In 1697, he became a member of the council of state, and in the following year first almoner to the duchess of Burgundy. He spent the last year of his life in his diocese, where he died 12th April, 1704. He was alike strict in morals and in religious doctrine: his strictness in the latter he showed particularly in his controversy with Fénélon (q.v.), whom he accused of heresy for his defense of the Quietists (q.v.). His style is vigorous and artistic. His orations at the funerals of the duchess of Orleans and the great Condé are particularly noted as masterpieces of this kind of eloquence. All his writings attracted much attention. For the defense of those dogmas of the Catholic church which are rejected by Protestants, he wrote his *Exposition de la Doctrine de l'Eglise Catholique sur les Matières de Controverse* (Par. 1671). His greatest controversial work is his celebrated *Histoire des Variations des Eglises Protestantes* (2 vols., Par. 1688), in which he founds his argument chiefly upon the doctrinal diversities of the churches of the reformation. To the defense of the four articles of the Gallican church he devoted his *Defensio declarationis celeberrimæ, quam de Potestate Ecclesiæ sanxit clerus Gallicus a.* 1682 (2 vols., Luxemb. 1730). With a view to the instruction of the dauphin, he wrote his *Discours sur l'Histoire Universelle jusqu'à l'Empire de Charlemagne* (Par. 1681), a work particularly deserving of notice, as the first attempt at a philosophical treatment of history. The continuation of it to the year 1661 (Par. 1805) is entirely derived from materials which he left behind him, but to which the last touch of his own hand was wanting. Another fruit of his political and historical studies was the *Politique tirée de l'Ecriture Sainte* (Par. 1709). The most complete edition of his works is that published under the care of the Benedictines (46 vols., Versailles, 1815–19).—His nephew, JACQUES BOSSUET, died bishop of Troyes, 12th July, 1743. His very extensive correspondence, chiefly devoted to the elucidation and investigation of the views of Fénélon, is included in the above-mentioned edition of the works of his uncle.

BOSSUT, CHARLES, a French mathematician and natural philosopher, b. 11th Aug., 1730, at Tartarus, near Lyons. So early as the year 1752, he became professor of mathematics in Paris, and in 1768 was received into the academy of sciences. The revolution deprived him of his situation and his income, and he lived in the greatest seclusion, and in almost misanthropical discontentment, till under the empire he was appointed a professor in the polytechnic school. He died 14th Jan., 1814. His works are very numerous. The following may be mentioned as particularly valuable: *Recherches sur la Construction la plus avantageuse des Digues* (Par. 1764); *Recherches sur les Altérations que la résistance de l'éther peut produire dans le Mouvement des Planètes* (Par. 1776); *Nouvelle Expérience sur la Résistance des Fluides, par d'Alembert, Condorcet, et Bossut* (Par. 1777); *Traité élémentaire de Mécanique et de Dynamique* (Charleville, 1763); *Cours Complète des Mathématiques* (7 vols., Par. 1795–1801); *Cours de Mathématique à l'Usage des écoles Militaires* (2 vols., Par. 1782); *Essai sur l'Histoire Général des Mathématiques* (2 vols., 2d ed., Par. 1810), one of the best works on the history of mathematics; and *Traité du Calcul Différentiel et Intégral*. All his works are distinguished by methodical arrangement and great clearness. He was a great admirer of Pascal, and edited his works (15 vols., Par. 1779), to which he prefixed an introductory *Discours sur la Vie et les Ouvrages de Pascal*, in 5 vols.

BOSTAN', (EL), a t. in Asiatic Turkey, in the pashalic of Marash, situated in a plain on the Sihun, on the n. side of Mount Taurus. Lat. 38° n., long. 36° 23′ east. B. can

be surrounded with water on the approach of an enemy; it has several mosques, and a considerable trade in wheat. It occupies the site of the Cappadocian Comana, which had a celebrated temple dedicated to a deity which is "supposed to have been called *Ma* in the language of the country, and to be the moon-goddess." Pop. between 8000 and 9000.

BOSTANJI, a class of men in Turkey who, originally the sultan's gardeners (the name being derived from *bostan,* a garden), now perform, in addition to their garden labor, a variety of duties, such as mounting guard at the seraglio, rowing the sultan's barge, and attending on the officers of the imperial household. They are under a chief called Bostanji Bashi, who holds the rank of a pasha, and is governor of the sultan's residences, and steersman of his barge. He also holds the inspector-generalship of the woods and forests in the vicinity of the capital, has the jurisdiction of the shores of the Bosporus and sea of Marmora, and is, altogether, so important a functionary that only personal favorites of the sultan can hope to fill the office. The financial reforms of sultan Mahmoud, however, have greatly lessened the emoluments of the post. The B. at one time amounted to 5000, and were divided into companies, like the janissaries, with whom they were united in military duty. In war-time, their strength was 12,000. A scarlet bonnet, of excessive dimensions, formed the distinctive part of their costume. Their number now does not amount to more than 600.

BOSTON, an ancient English borough and seaport in Lincolnshire, on both sides of the Witham, 28 m. s.e. of Lincoln. It is supposed to be identical with the Icanhoe, where St. Botolph founded an abbey in 654, destroyed in 870 by the Danes. Under the Normans, B. became a place of importance, and in 1204 it paid the largest dues (£780) of any English port except London (£836). In the reign of Edward III., many foreign traders settled, and the merchants of the Hanseatic league established a guild in Boston. After their departure, the town declined, and the suppression of the monasteries by Henry VIII. further injured it; but his grant of a charter of incorporation, and Mary's subsequent grant of extensive lands, partly compensated for this. The modern town consists chiefly of two good streets, one on each side of the river. The parish church of St. Botolph (1309), 245 by 98 ft., is one of the largest without cross aisles in England, and has a fine tower 300 ft. high, surmounted by a lantern, visible 40 m. out at sea. The church was partially restored in 1857, at the expense of the inhabitants of Boston in America. The clearing of the river of silt, and the closing of the adjacent fens, have greatly promoted the trade of Boston. Vessels of 300 tons can reach the heart of the town. The chief export is corn. Pop. of muni. bor. (1871), 14,526; of parl., which returns two members to parliament, 18,279. B. is a great market for cattle and sheep, and manufactures canvas, iron, brass, ropes, leather, bricks, whiting, and hats. In 1876, 542 vessels of 28,535 tons entered, and 617 of 40,586 tons cleared the port. Fox, the martyrologist, was born there.

BOSTON, capital of Massachusetts, United States, is situated in lat. 42° 21′ n., and long. 71° 4′ w. It stands at the w. end of Massachusetts bay, on an inlet, which, whether for defense or trade, forms one of the best havens in the world. This inlet, known as Boston harbor, the primary source of the city's growth and prosperity, has a seaward barrier of two headlands, the interval of 4 m. being so subdivided by an insular breastwork as to leave only three practicable entrances, the main one barely wide enough for two vessels to pass one another; while the inclosed space of about 75 sq.m. —at least half of it affording depth for the largest ships—greatly augments, with its islands and its peninsulas, both its military and commercial capabilities. On an oblong peninsula, of about 700 acres, running to the n.e., B. was founded in 1630, its original owner, John Blackstone, selling out his right and title, five years thereafter, for £30. With so well chosen a site, and, doubtless, also through the industry and enterprise of its Puritan occupiers, the new town increased so steadily in wealth and population, that in less than a century and a half it became the foremost champion of colonial independence. Since then it has overleaped its natural limits, swarming off, as it were, into an island towards the n.e., and into the mainland on the s.e., and consists of Old, East, and South Boston; Roxbury, annexed in 1868; Dorchester, annexed in 1870; and Charlestown, Brighton, and West Roxbury, annexed in 1873; which are connected together by bridges. An immense dam, called the Western avenue, connects the whole with the inner side of the harbor. All the divisions of the city are of an uneven surface. Undulation, in fact, is a characteristic of the entire neighborhood—continent, islands, and peninsulas, alike. From this irregularity, so different from the straight and formal lines of street in American cities, and also from being built of a very neat kind of brick, B. has much the appearance of a substantial English provincial town; the resemblance being, perhaps, heightened by the dress, manners, and feelings of the inhabitants, who are essentially of the old British type, as befits the descendants of the "Pilgrim Fathers." On a peninsula to the n. of East B., rises Bunker's hill, so famous in the war of independence; while the Dorchester heights, only less famous, occupy the center of South B.; and, lastly, the peninsula of Old B. seems to have originally taken the name of Tremont, from its three mounts or hillocks. Between 1840 and 1850 the population had swelled from 93,383 to 136,881; (1860) 200,000; (1870) 250,526; (1875) 341,919. Among the public buildings, the principal are the state house, city hall,

Faneuil hall, Faneuil hall market, Massachusetts hospital, post-office, custom-house, county jail, houses of industry and correction, two theatres, an athenæum, an odeon, a library, a music-hall—said to be one of the finest concert rooms in the world—and 200 churches. Among other objects worthy of note are the Common, a beautiful park of 50 acres, on the peninsula; the wharves and quays; and the bridges, sixteen in number, which unite together the different portions of Boston. The water-works demand more special mention. To say nothing of an earlier enterprise of the kind on a smaller scale, the waters of lake Cochituate, distant 20 m., have since 1848 been conveyed by a brick conduit into the grand reservoir of Brookline, at the further end of the Western avenue, and thence been carried into the subordinate reservoirs respectively of the different sections of the city. The annexation of Charlestown brought with it the waters of Mystic lake. B., as the center—social, political, and commercial—of the best educated and most intelligent state in the union, is pre-eminent throughout the republic in literature and science. Its trade, likewise, is marvelous: it is, in fact, more marvelous, in proportion to physical facilities, than even that of New York, for while the latter city, with the lakes on the one side and the ocean on the other, and with the Hudson as a link between them, drains regions of vast extent and singular fertility, B., to say nothing of rugged soil and ungenial climate, is cut off from the interior, such as it is, by the entire want of inland waters. But what New York has so largely inherited from nature, B. has in some measure created for itself. By eight great systems of railway it reaches, besides the coasts to the n. and s., the St. Lawrence and the lakes, the Hudson and the Mississippi; while, as the transatlantic terminus of the Cunard line, it virtually connects those channels of communication with Great Britain and its network of iron roads. In several departments of maritime traffic, such as the coasting intercourse and the trade with Russia, India, and China, B. is understood to possess far more than its share; and as the port of the manufacturing districts of the union, it may be said to monopolize the carrying alike of raw material and of finished goods. The chief exports are beef, pork, lard, fish, ice, woolens, cottons, paper, boots and shoes, cordage, hardware, and furniture; while the imports, wafted from all corners of the world, comprise nearly every article that has a name in commerce. The total number of vessels that entered the port in the year ending June 30, 1874, was 2717, of 730,769 tons, and the total number that cleared was 2552, of 659,102 tons. The total value of the imports in the same year was $52,212,405; and of the exports, $28,335,627. In 1877, the municipal debt was $26,159,777; the valuation of the city for taxation purposes was $630,427,200. The banks of the city possess an aggregate capital of $48,600,000; and there are issued 150 periodicals, nine of which are dailies. The charitable institutions, schools, and public libraries of B. are in harmony with the city's importance in other respects. The B. public library, with about 200,000 volumes, is the largest in the United States, after that of congress. In 1822, B., previously ruled like an ordinary township by selectmen, adopted a municipal organization, with a mayor, aldermen, and councilors.

BOSTON (*ante*), the capital of the commonwealth of Massachusetts and of the county of Suffolk, the largest city in New England, and, of American cities, second only to New York in the extent of its commerce, is situated on Massachusetts bay, at the mouth of the Charles river, in lat. 42° 21′ 28″ n., long. 71° 3′ 52″ w. from Greenwich.

The spot was first visited by Europeans in 1621, when a party of pilgrims from Plymouth, on an exploring expedition, entered the harbor and regretted that they had not made their own settlement where the city now stands. At about 1623, William Blaxton or Blackstone, an Episcopal clergyman, established himself on the w. slope of Beacon hill, not far from where Louisburg square is now situated. In 1627, certain men of fortune and religious zeal, merchants and "country gentlemen," in Lincolnshire, England, began to consult regarding planting a colony in New England, to spread the Gospel and advance the glory of God. On Mar. 4, 1629, Charles I. signed a charter constituting a body politic by the name of "The governor and company of the Massachusetts bay in New England." Charles II. at a later date stated that "the principle and foundation of the charter of Massachusetts was the freedom of liberty of conscience." On Aug. 26, in the same year, 12 men of large fortune and extensive cultivation in Cambridge, England, entered into an agreement to emigrate to the new country, provided the place of holding the courts should be removed from London to Massachusetts before the end of the following September. Among the men who joined in this agreement were John Winthrop and Richard Saltonstall. The government was transferred with the patent in Aug., and the commercial corporation became the germ of the present commonwealth. In the spring of 1630, the emigrating party sailed from Southampton in the ship *Arbella*, and entered the harbor of Boston June 17. Winthrop first settled at Charlestown, but subsequently removed to Boston, which received its name Sept. 17 (N. S.). The name was taken from Boston in Lincolnshire (which is a corruption of Botolph's Town), from its patron saint, whose church was founded in the 7th century.

Originally but a small peninsula connected with the mainland by a narrow isthmus called the "Neck;" the city now embraces nearly 23,000 acres, 800 of which were formed by filling in adjacent low lands. The territory has been increased also by the annexation of South Boston (a portion of Dorchester), in 1804; of the island of East Boston, in

1832; of Washington village, in 1856; of Roxbury (Boston Highlands), in 1867; of the remainder of Dorchester, in 1869; and of Charlestown, Brighton and West Roxbury, in 1873. The city contains 350 m. of streets, which have cost, since the incorporation of the city, in 1822, more than $31,000,000. In the older portions many streets are narrow and crooked; but after the fire of 1872, advantage was taken of this feature to make architectural effects in the new buildings, which are very pleasing, and would have been impossible had the streets been more regularly laid out. After the revolution the names of streets which were reminders of royalty were, in many cases, changed for more republican appellations, though many continue reminders of the old country, both in their names and in their appearance. The city is connected with its suburbs by many bridges, which are noted rather for their convenience than for their elegance, though that leading to South Boston is more pretentious than the others. The Mill-dam, begun in 1818 and completed in 1821, at a cost of $700,000, is a continuation of Beacon street, and originally inclosed 600 acres of "flats" which were overflowed by the tide. These, having been filled in, constitute the "Back Bay lands," and the district contains some of the most elegant dwellings and churches of the city. In the sleighing season the Mill-dam was formerly the scene of much hilarity and fast driving, but the advance of population has driven the horsemen to the Brighton road, a little further from the center of the town in the same direction. The suburban region lying about Boston is remarkable for the beauty of its varied scenery, as well as for the elegance and taste displayed in the private dwellings with which it is adorned.

Boston has many small parks, and an extensive series of connecting parks has been designed and is in process of formation, but at present the Common and the Public garden, in the heart of the city, are its chief pleasure grounds. The two comprise 70 acres, laid out with care, adorned with lofty elms and sheets of water, and with monuments. The city has, in public places, statues of Charles Sumner, Josiah Quincy, gov. Winthrop, Benjamin Franklin, Edward Everett, Horace Mann, Alexander Hamilton, Daniel Webster, Columbus, Washington, gov. Andrew, and Samuel Adams. Besides these, there is in Park square a group representing the emancipation of slaves, and on the Common another to the memory of the national soldiers who died in the war of the rebellion.

The harbor of Boston is a handsome sheet of water covering 75 sq. miles. It includes many islands, and is well fortified by forts Independence (until 1798 castle William) and Winthrop, opposite each other at the entrance of the main channel, and fort Warren, on George's island, lower down the harbor, opposite the end of Nantasket or Hull. Three light-houses mark the entrance to the harbor. Boston light is situated nearly two m. e. of fort Warren, and shows a revolving light 92 ft. above the level of the sea. The Spit, or Bug light, exhibits a fixed red light, about 35 ft. above the level of the sea. It stands upon iron pillars fixed in the rock, and can be seen at a distance of about seven miles. Long Island light, named from the island on which it stands, is a tower 22 ft. above the ground, but 80 ft. above the sea. A strong battery is now in process of erection on Long Island.

The executive power of Boston is vested in the mayor and 12 aldermen; and the legislative functions are performed by the mayor, aldermen, and 72 councilmen, all of whom are elected annually on the Tuesday after the second Monday in Dec. A fire commission, composed of three members, controls the fire department, which is admirably managed. Three commissioners also control the police department. The system of telegraphic fire-alarms was first introduced into Boston in 1851. The streets are kept clean, and the house offal is removed under the care of the superintendent of health. The house of reformation, the house of industry, and the alms-houses are situated on Deer and Rainsford islands, in the harbor, and are managed by the directors for public institutions. The house of correction and the lunatic asylum, under the control of the same body, are at South Boston. The city was supplied with water as early as 1795 from Jamaica pond, but the elevation was not sufficient to bring the supply to the higher portions of the city. In 1848, the Cochituate water-works were completed, and in 1872 the legislature passed an act permitting the city to take water also from Sudbury river. The latter works are now completed. Charlestown district is supplied from the Mystic water-works, which take water from Mystic lake in Medford.

Boston has many public buildings worthy of notice. Among those that are remarkable for architectural beauty or grandeur are the United States postoffice, on Postoffice square, Trinity church, the museum of fine arts, the hotel Vendôme, the cathedral of the Holy Cross, the state house, the English high and Latin school on Warren avenue, and the new "Old South church." The English high and Latin school was begun in 1877, and the portion to be used for school purposes is just completed, at a cost of more than $400,000. The remainder, which is to be used by the officers of the school-board, is to be added at a future time. The entire edifice will be one of the largest for educational purposes in America, or in the world.

Among the buildings remarkable rather for their historical interest than for architectural beauty is Christ church, on Salem street, the oldest church in the city, and the one from the steeple of which, in the revolutionary war, Paul Revere's signal was hung out by capt. John Pulling, merchant, of Boston. The Rev. Mather Byles, jr., was rector of this church during the revolution, and left town on account of his sympathy with the

royal cause. The old South church, built in 1730, is one of the most noted in the country. It was abandoned as a church in 1876, and since that time efforts have been made to purchase it as a monument commemorating the times that tried men's souls. In this building Joseph Warren delivered his memorable oration on the anniversary of the "Boston massacre," Mar. 5th, 1776. Here the patriots met to discuss the tax on tea. In 1775, the building was "desecrated" by British soldiers, who tore out its galleries, filled it with earth and used it as a place for cavalry drill. From 1712 to 1872, the annual "election sermon" was delivered in the old South church. It is now used as a historical museum. The most famous of the relics of the olden time is Faneuil hall, well known as the "cradle of liberty," from the fact that during the period preceding the revolution, it was used for public gatherings at which the patriotic spirit of the colonists was stirred by the eloquence of the popular favorites.

The original edifice was built as a market, and presented to the town by Mr. Peter Faneuil, in 1742. It was destroyed by fire in 1761 and rebuilt the following year. Before the adoption of the city charter in 1822, all town-meetings were held in Faneuil hall. The hall is 76 ft. square, and 28 ft. high, and possesses remarkable acoustic properties. Valuable paintings adorn its walls. A market is under the hall.

The "old state-house" stands at the head of State street. The town-house was built on the spot in 1763. The "Boston massacre" occurred in the street before it, and there the stamped clearances were burned by the mob, during the excitement caused by the stamp act. Independence was born in the building, according to gov. Adams, and from the balcony the declaration of independence was read. It was here that those town-meetings were held at which Otis uttered his prophetic and patriotic words, counseling peace, but foretelling probable war, and urging resistance to tyranny, "even unto blood," if necessary.

From the first, Boston has been noted for its commerce. Eight lines of railways connect it with the interior, and ships and steamers sail from the capacious harbor to all parts of the world. Large quantities of fish, ice, and manufactured products are exported. The ice trade was begun here by Frederic Tudor, who, in 1806, made the first shipment to Martinique. It is said that but for the trade in ice, the business between Calcutta and Boston would never have reached its present proportions. Boston is now the second city in the union for foreign commerce; it is a center of the boot and shoe trade, the leather trade, and of the trade in foreign and domestic dry goods. The manufactures of the city are many and varied, including—besides ship-building, sugar refining, and leather dressing—clothing, jewelry, chemicals, brass and iron castings, and books. The business of the city is promoted by sixty-one national banks—more than any other city in the union has—with a capital of more than fifty-three million dollars. Thirty of these have cash capitals of one million or more each. The surplus funds of the inhabitants are, in part at least, deposited in sixteen savings banks, the first of which, the Provident institution, was founded in 1816, and has larger deposits than almost any other institution of the kind in the country. These banks are strictly guarded by laws which restrict the amount that can be deposited by any one person and otherwise protect their solvency.

From the earliest days Boston has been noted for the care with which it provided for the religious wants of the people, for their education and for the distribution of literature. The first "meeting house" was erected near the head of State street, 1632. John Cotton was one of its pastors. The city contains now nearly 200 churches. Of these the larger numbers belong to the Congregationalists (evangelical), the Unitarians, Baptists, Methodists, Roman Catholics, and Episcopalians, in the order mentioned. Free schools, open to all, were established in the United States first in Boston 250 years ago, and the excellence of the system of public instruction there has been so great that many other cities have taken its schools for patterns. The university at Cambridge properly belongs to the Boston school system, for it was founded by the men who settled Boston and was intended for the education of the youth of the city and surrounding country. Indeed, "Newe Town," as Cambridge was first called, was intended for the capital of the commonwealth. It was John Winthrop who directed attention to the superior advantages of the neighboring promontory, after fortifications had been commenced at the former place. Harvard college was founded in 1636, and for two generations was the only college in New England. The public Latin school in Boston was founded in 1635, the institute of technology in 1861, Boston college in 1863, Boston university in 1869. There are more than 200 public schools in the city. Nine of them are high schools, 49 are grammar schools, and one is a normal school. The salaries of the teachers amount to about one and a quarter million dollars a year. Private schools abound, and their reputation is high. Chauncy Hall school, established 1828, is one of the most prominent of these. It occupies a building on Boylston street, near the institute of technology. In regard to the number and extent of its public libraries, Boston stands at the head of American cities. The chief libraries are the Public, with 360,000 volumes, distributing 1,250,000 volumes a year; the Athenæum, 115,000 volumes, circulating 50,000 volumes a year; the Historical society's library, containing 68,000 books and pamphlets, many of them being among the rarest of publications; the state library, with 40,000 volumes; the Social law library, with 15,000 law books; the library of the Historic-genealogical society, 74,000 books and pamphlets; the General theological library, with 13,000 volumes; the library

of the Natural history society, containing 17,000 books and pamphlets; the Congregational library, with more than 100,000 books and pamphlets, illustrating the history of the religious denomination to which many of the early settlers of New England belonged. Boston has musical societies, art associations and social clubs. Among the clubs the most prominent are the Somerset, the Union, St. Botolph, the Papyrus, the Saturday, and the Woman's club. Several of these have well-appointed buildings. The clergy have meetings at stated times for the discussion of topics related to their calling. Boston is well supplied with hospitals and societies for the aid of the indigent and suffering. In 1876, a plan for the registration of the worthy poor was set in operation, for the purpose of discriminating between the worthy and unworthy and for greater economy in the distribution of relief.

The city is well supplied with theaters, and is said to be one of the best in the country for the appreciation of good actors and singers. Also, there are many halls in which lectures are given from time to time on almost every topic that interests the human mind.

The 250th anniversary of the settlement of Boston was celebrated Sept 17, 1880, with great enthusiasm. For 193 years Boston was a town, the city charter having been accepted as late as 1822, after the subject of the change had been discussed for 170 years. The population for the first two centuries did not rapidly increase, being about 7000 in 1700; 15,520, in 1764; 18,038, in 1790; 61,392, in 1830; 250,526, in 1870; 341,919, in 1875; and 363,968, in 1880. Much of the late gain has arisen, of course, from the annexation of adjoining territory. In early days—at least as early as 1634—the town was governed by "selectmen," but when such officers had first been chosen is not now known. The first grand jury of the country met in Boston, Sept. 1, 1635. The church in Boston was vexed in early times by Roger Williams, Mrs. Anne Hutchinson, the Quakers, by women possessed by witches, and by Episcopalians; and rigid laws were enacted to bring the offenders to give up their peculiar views or leave the town. Boston sympathized with Goffe and Whalley, the regicides, who appeared in the town in 1666; in 1688, the inhabitants rose against the government and overthrew it: the city bore its share of the burden of the "old French war;" and its inhabitants entered with patriotic zeal into the struggle for independence. In the late war Boston was prompt to offer soldiers and money for the purposes of the general government, and her officers and men made a record of which they and their fellow-citizens have always been proud.

BOSTON, PUBLIC LATIN SCHOOL IN, founded 1635, is designed to give a thorough general culture to boys who intend to pursue the higher branches of learning, or to prepare for professional life. It is organized in six classes, and the full course of study covers the period of six years. Graduates of grammar schools, to whom diplomas have been awarded, are admitted without examination to whatever class their qualifications may entitle them to enter. Other applicants have to pass an examination equivalent to that required for admission to the third class of the grammar school. The standard of graduation is that of admission to colleges of the highest grade. The early records of the school are imperfect, but the catalogue printed in 1847 contains about 5000 names, and among them are many of those eminent in the history of the country. Adding those who have attended the school since that date, we have a total of about 7500. The whole number of graduates is reckoned at about 3400. It is believed that at least 3000 of its pupils are now living. It has now 13 teachers, and 400 pupils, and a library of about 3000 volumes, mostly classical. Prizes are offered annually for superior proficiency in various studies, and for exemplary conduct. The school was once on School street, on the site of the Franklin statue, in the rear of King's chapel; afterwards on the opposite side of the same street at the corner of the alley, on the site of the Parker House; at present on Bedford street. It will soon be removed to a new and elegant building on Warren avenue. The master of the school at present is Moses Merrill. Among the former masters were Philemon Pormot (first master), Ezekiel Cheever, Benjamin A. Gould, Charles K. Dillaway, Epes S. Dixwell, and Francis Gardner.

BOSTON UNIVERSITY, Boston, Mass., incorporated in 1869, was founded by Isaac Rich, Lee Claflin, and Jacob Sleeper. Its president since its foundation is William F. Warren, S.T.D., LL.D. The chief organs of its administration are: 1, the university corporation; 2, the university council; 3, the university senate; 4, the university convocation; 5, the faculties of the colleges; and 6, the faculties of the schools. The first consists of the president of the university and five classes of trustees, each holding office for five years; the second of the president and registrar of the university and the deans of all the faculties; the third includes all members of the council and all regular professors in the different faculties; the fourth consists, under certain statutory limitations, of all who have been admitted to degrees in the university. Departments, so organized as to presuppose on the part of the students a collegiate education or its equivalent, are called schools. Some of these, organized and administered in the interests of persons preparing for professional life, are called professional schools. Crowning all is the school of all sciences, a purely post-graduate department for candidates for the higher degrees. There are the following departments: college of liberal arts, established 1873; college of music, 1872; college of agriculture (Mass. agricultural college, at Amherst), 1875; school of theology, 1871; school of laws, 1872; school of medicine, 1873; school of all sciences, 1874. The college of liberal arts has fixed a standard for admission to classical degrees

as high as that of any other university. Post-graduate students in the university may fit themselves for professorships of Greek, Latin, modern languages, philosophy, history, etc. By arrangements with the authorities of the national university at Athens, and those of the royal university of Rome, members of the school of all sciences, duly recommended, may pursue, without expense for instruction and for any number of years, select or regular courses of study in any department of those universities, enjoying all the rights and privileges of university citizenship, and, upon returning and passing satisfactory examinations upon the work accomplished, can receive a degree as if they had remained in Boston. The greater part of the endowment of the institution was bequeathed by the late Isaac Rich, a member of the Methodist Episcopal church. As it is not to pass into the hands of the university corporation till 1882, its amount cannot yet be stated. The average number of officers of instruction and government during the past four years has been 100; the average number of students over 600. The institution maintains graded courses of instruction in theology, law, and medicine, three years in duration. In medicine its course extends through four years, while the degree of bachelor of medicine has been restored. The university was organized and has been constantly administered without any discrimination in government or teaching on account of sex. Every degree, privilege, and emolument is as open to women as to men. This institution does not gather its students into dormitories or exercise any supervision over them except in the recitation rooms.

BOSTON, a game at cards, played by four persons with two packs, one being dealt and the other cut to determine the trump. Five cards to each are dealt twice around and then three to each. If the first player can take five tricks he says "I go Boston," when the others may overbid by saying "I go 6," 7, 8, and so on. Should any player fail to make as many tricks as he said he could take, he pays such forfeit as may have been regulated before playing.

BOSTON, THOMAS, a Scottish divine, once extensively popular, was b. of poor parents at Dunse, Berwickshire, Mar. 7, 1676. As early as his 12th year he was concerned about the state of his soul, and while only a boy at the grammar school, he formed a society of three for religious conference and social prayer. After a hard struggle, he succeeded in entering Edinburgh university in 1691. He received license as a preacher in 1697, and was greatly appreciated by the serious portion of the community; but his uncompromising character prevented him from receiving a clerical charge for two years. He was then ordained minister of Simprin, and in 1707 was translated to Ettrick, where he died on the 20th May, 1732. Of his voluminous works, the best known, but not the most agreeable, is the *Fourfold State*, published in 1720. It discourses of man's paradisaical integrity, his ruin by the fall, his begun regeneration on earth, and consummate bliss or woe hereafter. An excellent little treatise of B.'s is entitled *The Crook in the Lot*. As a pastor, B. was eminently laborious, and deservedly popular. In the ecclesiastical courts he distinguished himself by his zeal in defense of the church's independence, and in the controversy regarding the *Marrow of Modern Divinity* (which was objected to as being too free in its offers of salvation), he was one of the ten ministers who declared their approval of that work. See MARROW CONTROVERSY. As a theologian, B. is perhaps the most "representative man" in the whole list of Scottish divines. His language, sentiments, and peculiar modes of expressing the peculiarities of Calvinistic psychology, have colored the style of Scottish preaching more than any other writer of the same school has done. Although often displaying what we should now call narrowness and ignorance, B. exhibits also flashes of insight and beauty, quaint felicities of diction—as, for instance, when, in *The Crook in the Lot*, he warns the profligate against the possibility of a "leap out of Delilah's lap into Abraham's bosom"—and an occasional shrewdness of thought, which are even yet worth studying. B.'s autobiography used to be a great favorite with the Scottish peasantry.

BOSTRA. See BOZRAH.

BOSWELL, JAMES, Esq., of Auchinleck, in Ayrshire, celebrated as the friend and biographer of Dr. Samuel Johnson, was b. Oct. 29, 1740, at Edinburgh, where his father was one of the judges of the court of session, and as such was styled lord Auchinleck. He was intended by his father for the profession of an advocate, and studied first at Glasgow, and afterwards at the then famous university of Utrecht, to which he went in 1763. When in London in that year he made the acquaintance of Johnson, an event of decisive importance for his whole subsequent life. The acquaintance was earnestly sought by himself, and originated in his strong literary tastes and his ardent admiration of Johnson's writings. He spent one winter at Utrecht, and then proceeded on a tour through Germany, Switzerland, and Italy, and visited Corsica with a letter of introduction from Rousseau to Paoli, with whom he contracted a warm and lasting friendship. He enthusiastically adopted the cause of Corsican independence; and after his return to Scotland, published an *Account of Corsica, with Memoirs of General Pasquale Di Paoli* (Glasg. 1768; 3d ed., Lond. 1769), which was speedily translated into several languages. B. became a member of the faculty of advocates in 1766, but never devoted himself with earnestness to the business of law. In 1773, he was admitted into the literary club instituted by Johnson, and of which Burke, Goldsmith, Reynolds, and Garrick were members. From this time he made it his principal business to note down the say-

ings and doings of Johnson, with whom he associated on most intimate terms, and whom he accompanied on his tour in Scotland and the Hebrides in 1773. Boswell was married in 1769 to a lady named Montgomery, by whom he had several children. Led by his taste for London society, he removed thither at a mature period of life, and entered at the English bar, but without attaining to any success in the profession. After Johnson's death in 1784, he employed himself in arranging the materials which he had collected, and preparing his long-contemplated biography. His *Journal of a Tour to the Hebrides* appeared in 1785, his *Life of Samuel Johnson*, in 2 vols., in 1791. Both have gone through many editions. B. has been emphatically styled by Macaulay "the first of biographers." His work is indeed full of details but they are such as exhibit character, and are arranged in the most interesting manner. He neither conceals his own faults, nor those of Johnson, but presents a picture of which the truthfulness is too evident to be questioned; and Johnson is perhaps already better known by the pages of B. than by any of his own writings. B. died in London, June 19, 1795. Besides the works already mentioned, he was the author of one or two minor productions of temporary interest. In Dec., 1856, there was published a posthumous volume of *Letters of James Boswell, addressed to the Rev. W. J. Temple, from the Original MSS.*, in which the gay, *insouciant* character of the man very strongly appears. His eldest son, Sir ALEXANDER BOSWELL, baronet, of Auchinleck, born 1775, was the author of a number of Scottish songs, full of humor, which he collected into a volume, entitled, *Songs, chiefly in the Scottish Dialect* (Edin. 1803), and some of which attained considerable popularity. He also wrote *Edinburgh, or the Ancient Royalty*, a picture of Scottish manners in the dialogue form, and edited many of the older productions of Scottish literature. A duel with Mr. Stuart of Dunearn, occasioned by personal allusions in a publication connected with a parliamentary election, resulted in his death on Mar. 26, 1822.

BOSWELLIA, a genus of trees of the natural order *amyridaceæ* (q.v.), having flowers with a small five-toothed calyx, five petals, and a crenulated grandular disk; a triangular capsule with three valves, three cells, and one seed in each cell; the seeds winged on one side; their cotyledons intricately folded, and cut into many segments. Two or three species only are known, of which the most interesting is *B. serrata* (or *B. thurifera*), the tree which yields olibanum (q.v.), now very generally believed to have been the frankincense (q.v.) of the ancients. It is a large timber-tree, with pinnate leaves, which have about ten pair of hairy serrated oblong leaflets, and an odd one, each leaflet about 1 to 1½ in. in length. The flowers are small and numerous, in axillary racemes, and of a pale pink color. When the bark is wounded, the olibanum flows out, of a delightful fragrance, and hardens by exposure to the atmosphere. The tree is found in the mountainous parts of Coromandel, and is supposed to be also a native of other parts of India, and of Persia, Arabia, and perhaps Abyssinia. *B. glabra*, a very similar species, a native of India, also yields a resin, comparatively coarse, which is sometimes used for incense, and is boiled with oil as a substitute for pitch.

BOSWORTH, or MARKET BOSWORTH, a market t. in Leicestershire, on an iminence in a very fertile district, 12 m. w. of Leicester. Pop. in 1871, 13,746, many of whom are employed in knitting worsted stockings. On a moor in the vicinity was fought, 1485, the battle in which Richard III. was slain, and which terminated the wars of the roses. On an elevation, called Crownhill, lord Stanley placed the crown on the head of the earl of Richmond, Henry VII. Here Simpson the mathematician was born; Dr. Johnson was an usher in the free grammar school, in which Salt the Abyssinian traveler, and Richard Dawes the Greek critic, were educated.

BOSWORTH, JOSEPH. D.D., a distinguished philologist, was a native of Derbyshire, where he was b. in 1789. He graduated first at Aberdeen, and afterwards at Leyden; he also took the degrees of B.D. and D.D. at Cambridge and Oxford. He obtained a curacy in the English church in 1815, and two years afterwards the vicarage of Horwood Parva, Buckinghamshire. He now devoted such time as an active discharge of his parochial duties left at his disposal to literature, and especially to researches in Anglo-Saxon and its cognate dialects. The result of his labors appeared in 1823 in a work, entitled *Elements of Anglo-Saxon Grammar*. Fifteen years afterwards, he published the work by which his name is best known, *A Dictionary of the Anglo-Saxon Language* (Lond. 1838), which is considered alike remarkable for its ripe scholarship, enlarged views, copiousness, and accuracy. An abridged edition was afterwards issued by the author. B. resided in Holland eleven years, from 1829 to 1840, as British chaplain. He returned to England in 1840, and was presented to the vicarage of Waithe, in Lincolnshire. In 1858, he became rector of Water Stratford in Buckinghamshire, and also professor of Anglo-Saxon at the university of Oxford. In 1865, he published the gospels in Gothic of 360 A.D., and the Anglo-Saxon of 995 A.D., in parallel columns with Wycliffe's version of the year 1389, and Tyndale's of 1526. He was author of various other works of a philological character. His death took place on May 27, 1876.

BÓSZÖRMÉNY, the chief of the six towns of the free district of Hadjuk, in the e. of Hungary, about 10 m. n.n.w. of Debreczin. It carries on an active trade in rye, tobacco, water-melons, soda, and saltpeter. The population in 1869 amounted to 19,208.

BOT, BOT-FLY, and GAD-FLY, names common to many insects of the family *œstridæ* (q.v.) or *œstracidæ*, the genus *œstrus* of Linnæus. The name bot is sometimes restricted

to the larvæ, which appears to have been its original use, the other names being given to the perfect insects; the name gad-fly often to insects of the genus *tabanus* (q.v.), to which some try to restrict it. The insects of this family are now supposed not to be those which were called *æstrus* by the ancients, although, like them, extremely troublesome to cattle. They are dipterous (two-winged) (q.v.) insects, nearly allied to the *muscides* (house-fly, flesh-fly, blow-fly, etc.), with small 3-jointed antennæ, and mouth destitute of a proboscis.—The horse-bot, or gad-fly of the horse (*gasterophilus*, or *gastrus*, or *æstrus equi*), sometimes also called the *breeze* and *horse-bee*, is much less common in Britain than in some parts of the continent of Europe, and occurs chiefly in elevated healthy districts. It is not quite half an inch in length, woolly, with yellowish gray head, rusty thorax, abdomen, and the wings whitish, with brownish-gray spots. The abdomen of the female terminates in a blackish horny tube. In the latter part of summer, the female hovers about horses, and deposits her eggs on their hairs, where they remain attached by a glutinous substance until they, or the larvæ just emerging from them, are licked off by the tongue of the horse, their destined place being its stomach. It is believed that the fly deposits her eggs only on those parts which are accessible to the horse's tongue, seeming to prefer the back of the knee-joint, where they may sometimes be found in hundreds. The larva is yellowish, without feet, short, thick, soft, composed of rings which have a double row of short teeth surrounding them; it is somewhat acuminated at one end—the head; and the mouth is furnished with two hooks, one on each side, for taking hold of the inner coat of the horse's stomach, to which the B. attaches itself, and from which it derives its subsistence, hanging in clusters sometimes of three or four, sometimes of more than one hundred. Here it spends the winter, and in the following summer, when it is about an inch long, it disengages itself, and being carried through the horse's intestines, burrows in the ground; and changes into an oval black pupa with spiny rings, from which, in a few weeks, the perfect insect comes forth. Multitudes, of course, become the prey of birds, before they can accomplish their burrowing.—It has been disputed whether or not bots are very injurious to horses; and some have even maintained that, when not excessively numerous, their presence is rather beneficial, an opinion which is certainly not recommended by its apparent probability, whilst it seems to be universally admitted, that in great numbers they are hurtful.—The red-tailed horse-bot (*G.* or *Œ. hæmorrhoidalis*), also a British species, deposits its eggs upon the lips of the horse, distressing it very much by the annoyance which it gives in so doing. The larvæ attach themselves chiefly to the surface of the intestine, about the anus of the horse, and sometimes cause an annoying irritation. Linseed-oil is used for their removal.—The Ox-bot, or ox gad-fly (*æstrus* or *hypoderma bovis*) is more troublesome than any species of horse-bot. It is a beautiful insect, not quite half an inch long, and thicker in proportion than the horse-bots; it has brown unspotted wings; the face whitish, the crown of the head brown, the thorax black, the abdomen whitish, with a broad black band around the middle, and yellow hairs at the extremity, where also the female has an ovipositor—a remarkable organ, formed of a horny substance, and consisting of four tubes retractile within one another, like the pieces of a telescope; and the last of them terminating in five points, three of which are longer than the others, and hooked. By means of this organ, a small round hole is pierced in the hide of an ox's back, in which an egg is deposited. The fly is very quick in depositing her egg, not remaining upon the back of the animal more than a few seconds. Cattle exhibit great alarm and excitement at the presence of the gad-fly, and rush wildly about, with head stretched forward, and tail stuck out, to escape from their tormentor. The further injury done by this insect is not, however, usually great; the larva—a little pearl-white mag ot (*warble* or *wormal*)—feeding upon the juices beneath the skin, causes a swelling, called a *warble*, forming a sort of sac, within which it lives and grows, amidst a kind of purulent matter suited to its appetite; and from which it finally emerges, leaving a small sore, and like the horse-bot, undergoes its further transformations in the ground. By pressure on the warbles, bots may be destroyed, and when they are numerous, assiduous oiling of the back of the ox is resorted to for the same purpose.—The Sheep-bot (*œphalemyia* or *æstrus ovis*) is a much more serious pest than any other British species, and is not unfrequently very destructive to flocks. The insect is smaller than either the ox-bot or horse-bot; it is of grayish color, with a large head and yellow face, and is most abundant in damp situations and woody districts. It is to be seen chiefly in the months of June and July. Sheep exhibit great alarm when it approaches them, and seem to seek, by keeping their noses close to the ground, and by incessant motion of their feet, to keep it from entering their nostrils. It is in the nostrils of the sheep that this fly deposits its eggs, and the larvæ, when hatched, make their way into the maxillary and frontal sinuses, feeding upon the juices there, until they are ready to change into the pupa state, in April or May of the following year, when they find their way again through the nostrils to the ground. They seem to cause great irritation in their progress up the nostrils of the sheep, and the poor animals run hither and thither, snorting and in great excitement. "The common saying, that a whimsical person is *maggoty*, or has got *maggots in his head*, perhaps arose from the freaks the sheep have been observed to exhibit when infested by their bots." The bots cause considerable irritation in the cavities, where they usually fix themselves, and sometimes get into the brain, and cause death.—These larvæ move with considerable

quickness, holding on by the hooks with which their mouth is furnished, and contracting and elongating the body. It is said that flocks fed where broom is in flower are never infested with them; and when many cases arise in a flock, it is found particularly advantageous to remove it to a dry soil.—Goats, deer, and other quadrupeds are also liable to be assailed by different kinds of gad-fly. The eggs of one of the species which attacks the fallow-deer, are deposited in the nostrils, and the larvæ make their way in large numbers to a cavity near the pharynx. Reindeer are excessively tormented by these insects, one kind depositing its eggs in their nostrils, and another in their skin; and it is no infrequent thing for a large part of a flock to be destroyed by them. When feeding where bot-flies are numerous, they keep such watch against them, that they neglect to eat, become emaciated, and often actually perish in consequence.—Even human beings have sometimes been afflicted by insects of this family. Humboldt saw Indians in South America having the abdomen covered with tumors produced by their larvæ.

BOTAL'LI, LEONARDO, b. 1530, in Piedmont; physician to the queen of Charles IX. and to Catherine de Medici. He was the author of several medical works, but is best known by his blunder in describing the foramen ovale between the right and left auricles of the heart, still known as the "foramen of Botal." He found this open in a grown person—an exceptional case, since it is usually closed at or soon after birth, but he took the exceptional for the natural condition, and described it as an opening for passing arterial blood into the left auricle.

BOTANIC GARDEN, a garden devoted to the promotion of botany, and in which plants are collected and cultivated in order to scientific study. The various economical applications of botany, however, in agriculture, manufactures, medicine, etc., are almost always kept particularly in view; and one great object of a B.G. is to bring to a country useful foreign plants, to determine the question of their suitableness to its climate, and to introduce those which may be cultivated with advantage. B. gardens are now deemed indispensable to universities; they are reckoned among the public institutions of great cities, and even of nations, and are established in new colonies, not only for the sake of science, but as one of the means of promoting their prosperity. They are utterly unknown to the ancients, although some of the secondary objects in which they are found most useful engage the attention of both Greeks and Romans. The first approach to a B.G. appears to have been made about 1309 A.D., in the garden of Matthæus Sylvaticus, at Salerno; botanical science, however, being merely subservient to medicine. Of a similar character was the medical garden established at Venice, by the republic, in 1333. The example of Venice was followed by other Italian cities, and plants from different parts of the world began to be collected. At length, about contemporaneously with the revival of botanical science in modern times, the first true B.G. was formed in 1533 at Padua, by Musa Brassavola, for Gaspar de Gabrieli, a wealthy Tuscan noble; which was soon followed by those of Pisa, Florence, Bologna, and Rome. The first public B.G. was that of Pisa. A public B.G. was established at Padua in 1545, by a decree of the republic of Venice, at the request of the professors and students of medicine. The republic of Venice greatly encouraged the study of botany by sending persons to the Levant, to Egypt, and even to India, to procure plants for this garden.—The B.G. of Leyden was begun in 1577; it enjoyed in its infancy the care of Clusius, and was brought to great perfection by Boerhaave, who was professor of botany there.—The first public B.G. in Germany was established by the elector of Saxony at Leipsic in 1580, and was soon followed by others.—France had no B.G. till Louis XIII. established the *jardin des plantes* at Paris, which was begun in 1610, but not completed till 1634.—Nor was there any public B.G. in England till 1632, when that of Oxford was founded by the earl of Danby. Private B. gardens, however, had existed in England for the greater part of a century before.—The G.B. of Edinburgh, the first in Scotland, was founded about the year 1680, as a private B.G., by Dr., afterwards Sir Andrew, Balfour, a zealous naturalist, who had inherited a collection of plants formed by a pupil of his own, Patrick Murray, of Livingston, at his country-seat, and transferred them to Edinburgh; and the city of Edinburgh afterwards allotted to it a piece of ground, and allowed an annual sum for its support out of the revenues of the university.

The B.G. at Kew occupies a high place among British national institutions; it possesses one of the richest collection of plants in the world, and has been greatly improved under the care of sir William Jackson Hooker and his son, who succeeded him in 1865. The *Hortus Kewensis* of Mr. Aiton, to whom the garden owed much of its prosperity in the 18th c., illustrates the greatness which it had even then attained. One of its chief glories is now its immense palm-house, finished in 1848, which is 362 ft. in length, and the central part of it 100 ft. wide and 66 ft. high.—A palm-house has, in like manner, greatly added to the attractions and value of the B.G. of Edinburgh. It is 100 ft. long by 60 ft. wide, and 70½ ft. high. These houses permit something of the stateliness and magnificence of the palms of the tropics to be seen in Britain.

Of B. gardens on the continent of Europe, the *jardin des plantes* may be regarded as holding the first place, both with reference to the strictly scientific study of botany, and to the care bestowed upon the introduction and diffusion of useful or beautiful plants from all parts of the world. There exists in France what may be called a system of B.

gardens—one at least in every department—to which plants are sent from the *jardin des plantes*, and from which, as they continue to be multiplied by propagation, they soon find their way into the hands of nurserymen and private cultivators. The B.G. connected with the imperial palace at Schönbrunn, in Austria, and that of Berlin, are the greatest in Germany. The former, which was begun in 1753, by the emperor Francis I., was supplied with West India plants at enormous expense, the celebrated Jacquin being sent to procure them. The B.G. of New York is perhaps the most worthy of notice among the numerous bonanic gardens of America; and that of Calcutta deserves to be mentioned, as an important connecting-link between the B. gardens of Europe and the botany of India. It has enjoyed the care of a succession of eminent botanists, and has been very useful both in transmitting Indian plants to other parts of the world, and in introducing valuable productions of other countries into India.

In the laying out and arranging of B. gardens, different methods are adopted, mere convenience and beauty being in some cases primarily regarded, and these in other cases being sacrificed to the supposed interests of science in an attempted scientific arrangement. A perfect adherence to a botanical system is, for obvious reasons, impossible; but a scientific arrangement of the plants in natural groups, in so far as it can be conveniently accomplished, greatly increases the usefulness of a B.G., and facilitates the study of botany. Sometimes houses are devoted to particular orders of plants, as palms, heaths, or orchids; sometimes to plants of particular habits, as aquatic plants; and sometimes portions of the garden are advantageously devoted to the exhibition, at one view, of plants valuable for particular uses, as cereals or corn-plants, plants yielding fiber, etc.

BOTANIC GARDEN (*ante*) of Harvard university was founded in 1805, in March; William Dandridge Peck was chosen professor. He began to lay out the garden, but the next year went to Europe to examine similar institutions. There was a scarcity of money, and the garden languished for years. It was in charge (about 1822) of Thomas Nuttall, an English botanist, who, in 1833, suddenly deserted his post to make a tour across the continent and to the Sandwich islands. In 1842, Dr. Asa Gray was appointed Fisher professor of natural history, on the endowment given by Dr. Fisher of Beverly. In 1848, a study was built for a herbarium, and used for botanical instructions. In 1857 a new and larger conservatory was built. In 1864, the herbarium was erected, the gift of Nathaniel Thayer. After much exertion, the establishment was practically completed in 1871 by the fitting up of a lecture-room and laboratory, and an extension of the conservatory, thus connecting the herbarium on one side and the conservatory on the other into a continuous range, and affording the means of giving the whole botanical instruction throughout the year at the garden, in connection with the materials and collections which illustrated it. A fine botanic garden is connected with the department of agriculture at Washington, and there are others more or less important in various parts of the country.

At Buitenzorg, in the island of Java, near the foot of Mt. Salak, are botanic gardens which have been called the finest in the world. Here one can wander for hours through avenues of every kind of tropical palm. The orchids are a splendid collection, containing specimens of nearly every known kind of lælia, dendrobium, eria, bolbophyllum, cypripedium, and a host of others.

There are huge beds of ferns; plantations of gigantic yucca and pandanus, interspersed with dracænæ and eucharis; a forest of tree ferns, many of them upward of 30 ft. high; with bamboo avenues, and nearly every palm. Among them grow enormous creepers, one of which winds in circles about the ground, and then goes over a palm-tree and down again, upward of 300 ft. long; 70 yards alone are on the ground.

BOTANOMANCY, divination by means of plants. See DIVINATION.

BOTANY (Gr. *botane*, an herb), the science which treats of the vegetable kingdom (see PLANT). Everything that relates to plants is included in this science; there are, therefore, several great branches of it, in many respects very different from each other. Of these branches of the science, some, relating to plants in general, rather than to particular kinds or species, are sometimes included under the designation of *general B.* (sometimes called *phytonomy;* Gr. *phyton*, a plant, and *nomos*, a law); whilst those which relate to particular species, their distinctive characters, distribution, etc., are, in like manner, comprehended under the term *special botany*.—In the former of these departments, the first place must be assigned to *structural B.*, also called *organology*, or *organography*, which has for its subject the structure of plants, the textures of which they are composed, and their various organs. Subordinate to this are the study of the elementary tissues of plants, sometimes called *vegetable histology* (see HISTOLOGY), and that of the anatomy of plants, sometimes called *phytotomy* (Gr. *phyton*, a plant, and *tomē*, a cutting); both of which have recently been prosecuted with great assiduity. In both, the microscope is an indispensable instrument, and by means of it all the important discoveries of modern times have been made. Intimately connected with these is *morphology* (Gr. *morphos*, a form, and *logos*, a discourse), that branch of botanical science which relates to what has been called the *metamorphosis of organs*, or, in other words, the gradual transmutation of leaves by the processes of vegetable life into the various organs with which a plant is provided, and their consequent assumption of new forms and

adaptation to new uses. This branch of B., entirely of recent origin, has been described as being in the vegetable what comparative anatomy is in the animal kingdom, and has now become the exposition of an admitted great general law, almost equally important in reference to structural B. and to vegetable physiology. *Vegetable physiology* or *physiological B.* treats of the various kinds of organic activity which are displayed in the life of plants. It is based upon *structural B.*, an intimate acquaintance with which is indispensable to the study of it. The arguments or illustrations of natural theology, derived from B., are chiefly taken from structural B. and vegetable physiology considered together, the wisdom of the Creator appearing in his works equally in their structure and in the adaptation of all their organs to their respective wonderful functions. In connection with vegetable physiology, another branch of science claims attention—VEGETABLE CHEMISTRY, of which there are two parts—an examination of the products of the living processes in plants, which, with all its well-known difficulty, is still comparatively easy; and an inquiry into these processes themselves, with respect to the chemical changes effected in them—an investigation of the secrets of that chemistry of nature which so far excels all that has yet been accomplished in laboratories. This is, however, a branch of the science of chemistry rather than of B.; but it so far belongs to the latter, that although only subsidiary, it is useful and indispensable. Even mathematics and natural philosophy, however, have been called to the assistance of the philosophical botanist in his attempts to explain the phenomena of his own science.

Special B. has been rendered subservient to the study of general B., and errors in the former are also guarded against by dependence, to a certain extent, on the well-ascertained principles of the latter. A comprehensive view of the vegetable kingdom is indeed impossible without an inquiry into the number and peculiarities of the different species which it contains; but the attempt to classify and arrange these can only be successful when it is founded on a knowledge of general laws relating to all vegetable organisms. That the discoveries of a botanist may be made known, the description of species is necessary; and works devoted to this are sometimes called works of *descriptive B.* or of *phytography* (*phyton*, a plant, and *graphē* a writing). But in the description of plants, a multitude of terms must be employed, which almost exclusively belong to botanical science itself, whilst even those which are common to it with other departments of natural history, must be employed in senses modified by the peculiarities of the vegetable kingdom. Many of the terms used are such as belong to structural B. and vegetable physiology; but many also—for example, adjectives which designate the particular forms of leaves, etc.—become familiar only when an acquaintance with them is sought to advance descriptive B., and a knowledge of the different species of plants. Great precision is necessary in the use of these terms, and from the want of it, the descriptions of the ancients and of travelers unacquainted with B. often leave it impossible to determine the particular species intended. This gives rise to what is sometimes called in botanical works *terminology*—an explanation of botanical terms, which, however, has no right to be regarded as a separate branch of science, or worthy of a distinct name; and the name which it has received is barbarous. When structural B. was little heeded, and little more was commonly supposed necessary for a botanist than a knowledge of species and the ability to distinguish them, "terminology" was often separately taught, and the student was required to commit long tables of terms and their meanings to memory—a difficulty placed in his way at the outset which was both formidable and repulsive, like that which the student of the Chinese language must expect to encounter in its alphabet.

The necessity of classification and systematic arrangement in B. will be very obvious, if the multitude of different kinds of plants is considered, fully 120,000 species being already known and described, whilst great regions of the earth are still unexplored. The systematic arrangement of plants is sometimes called *systematic B.*, sometimes *taxological B.* (Gr. *taxis*, order, and *logos*, a discourse), sometimes, less properly, *taxology* or *taxonomy*. The history and progress of the science have been marked by the different systems which have been proposed, and have prevailed at different times. These have, however, been of two very distinct kinds, founded upon very different principles, and particularly adapted to very different objects, and are respectively designated *artificial* and *natural* or *physiological* systems. Artificial systems are based upon some single class of characters, in the external parts of plants, without reference to the importance of these characters in what concerns the life of a plant, or the purpose for which it exists, and are chiefly adapted to the convenience of the student desirous of readily distinguishing species among the multitudes with which he has to deal. A work of descriptive B., arranged according to an artificial system, has been aptly likened to a dictionary in which the words are alphabetically arranged.

An artificial system cannot, however, serve the highest purposes of the science. But in framing a natural system, great difficulties are to be encountered, and imperfection of the system is necessarily to a certain extent involved in imperfection of the science. Based not upon one mere set of characters arbitrarily selected, but upon a consideration as far as possible of all characters which plants present, and not merely upon external forms viewed in themselves, but upon these and internal organization considered in their physiological relations, a natural system aims at exhibiting the real affinities which subsist in the vegetable kingdom; and evidently must be at all times liable to modification, and capable of improvement, as botanical science advances, either through the dis-

covery of new plantsor through phytotomical and physiological research: it also evidently requires the greatest scientific attainments and the highest powers of a philosophic mind. Nor is it one of the least of the practical difficulties, that the affinities of plants are not such as to constitute a simple lineal series, but that they may be viewed as a multitude of groups arranged around centers, and connected with each other upon different sides and by a great variety of ties.

Yet the rudiments of a natural system have always been sought after, and in some measure attained, when B. has been studied as a science—whenever it has become anything more than a mere acquaintance with a few plants and their names. The *genera* into which species are grouped by all botanists are natural, and are the basis upon which all classification proceeds in its further generalizations: So sensible was Linnæus of the importance of maintaining this character of the genera, that when a rigid adherence to his artificial system would have caused the division of a genus into parts, and the consequent separation of species very nearly allied, he kept the genus unbroken, and maintained the usefulness of his artificial system, to the student desirous of finding the names of plants, by referring from one of its classes or orders to another for species exceptional among those of their genus as to the number of their stamens or pistils, or their *diœcious, monœcious,* or *hermaphrodite* flowers.—The classification of species, however, in genera and larger natural groups, being a subject as much connected with other branches of natural history as with B., will more properly be treated in the article NATURAL HISTORY; and to that article also, and to the article SPECIES, we refer for all that our limits allow concerning some of the most interesting and difficult questions of science, the limits of species, the distribution of species, etc.

An important branch of botanical science is that which is called *geographical B.,* or the *geography of plants,* and sometimes *phytogeography.* It must be regarded as yet in its infancy, although a multitude of observations have been recorded in works of descriptive B., and by botanical travelers. It is the object of *geographical B.* to connect with the occurrence or prevalence of plants in particular countries a great variety of facts as to climate, altitude, geology, etc., and even facts of history. It aims at the establishment of great general laws, which, however, it has not yet been able to establish. Some account of the progress which has been made in this branch of B., and of the imperfect generalizations which have been reached, will be found in the article GEOGRAPHY OF PLANTS.

Another branch of botanical science which has recently sprung up, and has acquired great magnitude and importance, is PALÆONTOLOGICAL B., or FOSSIL BOTANY. The petrified fruits and wood, the beautiful impressions of ferns and palms, and other traces and remains of former vegetation, which appear in vast numbers and great variety in different strata of the earth's crust, present a most interesting field of scientific research. The study of the different kinds of fossil plants, and the comparison of them with existing species, belong strictly to the science of B.; the study of their relations to particular strata or formations, and so to particular periods in the physical history of the globe, belongs to geology. The study of fossil plants has proved exceedingly useful in guiding to just and philosophic views of the mutual relations even of species and groups still existing. See PALÆONTOLOGY.

The subject of the DISEASES OF PLANTS must be regarded as falling within the province of botany. It has scarcely yet been treated or studied as a distinct branch of science, although it has not been overlooked in its relation to vegetable physiology, with which its intimate connection is obvious, and it has received no little attention in its bearings on agriculture and other arts by which plants are made to supply the wants or minister to the comforts of man.

ECONOMIC B. includes all that relates to plants, considered with reference to these arts and to these uses. That part of it which relates to medicinal plants has been often separately and elaborately treated under the name of MEDICAL BOTANY. In the botanical articles of this work will be found notices of the more important plants affording food to man, and therefore cultivated in fields or gardens, in warm or in cold climates, and of those valuable for their timber, their fiber, or the dye-stuffs or medicines which they yield.

Having thus endeavored to sketch an outline of the science of B., we must refer to the articles PLANT, VEGETABLE PHYSIOLOGY, instead of attempting here to fill up a part of that outline by exhibiting the first principles of the science. It remains for us, in the present article, to give a very brief account of the history of B., and outlines of the systems of classification most deserving of attention.

We are informed that Solomon "spoke of trees, from the cedar in Lebanon even to the hyssop that springeth out of the wall." There is reason also to believe that Zoroaster devoted some attention to plants, and that this study early engaged some of the philosophers of Greece. The oldest botanical work which has come down to us is that of Theophrastus (q.v.), a pupil of Aristotle, who flourished in the 4th c. B.C. His descriptions of plants are very unsatisfactory, but his knowledge of their organs and of vegetable physiology may well be deemed wonderful, when we consider the low state of this branch of science throughout many centuries after his time. It was not, indeed, till after the rivival of letters in western Europe, that it was ever again studied as it had been by him. About four hundred years after Theophrastus, in the first c. of the

Christian era, Dioscorides of Anazarbus, in Asia Minor—a herbalist, however, rather than a botanist—described more than 600 plants in a work which continued in great repute throughout the middle ages, a sure proof how destitute that period must have been of any botanical science of its own. About the same time, the elder Pliny devoted a share of his attention to B., and his writings contain some account of more than 1000 species, but compiled from various sources without much discrimination, and mingled with many errors. Centuries elapsed without producing another name worthy to be mentioned in a history of botany. It was among the Arabians that the science next began to be cultivated, about the close of the 8th century. The greatest name of this period is Avicenna. Centuries again elapsed, a longer interval than before, during which it made no progress whatever. It was not till the beginning of the 16th c. that B. resumed its place as a science. The first to revive it was Otto Brunsfels, a German, who published in 1530 his *Historia Plantarum Argentorati*, or history of the plants of Strasburg, in 2 vols., folio, illustrated with cuts. He was speedily followed by Bock or Tragus, Fuchs or Fuchsius, and other Germans; by Matthiolus and Cæsalpinus in Italy; Dodœns or Dodonæus in the low countries; De L'Obel or Lobelius, a Dutch physician at the court of England; Gesner in Switzerland; Dalechampa and Moulins, or Molinæus, in France, and by many others, for B. now began to be prosecuted wherever learning flourished, and with great zeal and success. Chairs of B. were founded in universities, botanic gardens (q.v.) were established in many places, and travelers began to explore even remote parts of the world. One of the greatest names of the latter part of the 16th c. is that of L'Ecluse, or Clusius, who traveled through many countries, encountering great perils and hardships in pursuit of his favorite science, and was finally professor of B. at Leyden. The name of Dr. Turner, "the Father of English B.," belongs more to the 17th c. than to the 16th. The number of species known and described had increased, in the beginning of the 17th c., to more than 5000, but the study of them was much impeded by confusion of synonyms and by want of classification, whilst classification was rendered extremely difficult by imperfect knowledge of the structure and organs of plants. The foundations of a natural system of classification may be said to have been laid, in the latter half of the 17th c., by Dr. Robert Morison, a native of Aberdeen and professor of B. at Oxford, followed towards the close of the century by the celebrated Ray, one of the greatest naturalists that England has produced.

The application of the microscope in B. inaugurated a new epoch of the science, about the middle of the 17th century. Henshaw and Hook, both Englishmen, were among the first to employ this instrument to good purpose in the examination of the organs and structure of plants; but the greatest eminence belongs to the name of Grew, also an Englishman, a physician at Coventry, and to that of Malpighi, an Italian, perhaps still more celebrated for his anatomical than for his botanical discoveries. Vegetable physiology now began to be recognized as the highest department of botanical science.

In the latter half of the century, perhaps the most eminent name after Ray is that of Joseph Pitton de Tournefort, a French gentleman, who devoted his whole life to the pursuit of botanical science, and who must be particularly noticed in a sketch of the history of B., on account of a system which he proposed, and which was more generally received and employed than any other till the time of Linnæus. Another botanist of the same period, Rivinus, professor at Leipsic, gave to the world a botanical system which was received to some extent in Germany. Tournefort's system was partly natural and partly artificial; that of Rivinus was perhaps the most perfectly artificial that was ever proposed.

The science of B. made rapid progress during the 17th and 18th centuries, both by the extension of botanical research in different parts of the world, and the careful study of particular groups of families of plants. Its progress was promoted by the publication of many valuable descriptive works. Important discoveries were also made in vegetable physiology.

About the middle of the 18th c., the wonderful genius of Linnæus effected a great change in B., as well as in zoology. His name marks an epoch in the history of the science; not chiefly, however, in consequence of the new system which he introduced, nor even because of the discoveries which he made, but rather because he was able very thoroughly to make himself master of all that had been ascertained by his predecessors, and to exhibit it in lucid order. He gave also a great impulse to botanical studies by the enthusiasm with which he inspired his pupils. And among the benefits which he conferred on B., in common with zoology, not the least considerable was the introduction of trivial or specific names to be used along with the name of the genus as the designations of particular species.

From the time of Linnæus, the progress of B. during the remainder of the 18th c. became more rapid; and since the commencement of the 19th c., it has advanced with gigantic strides. A large space would be occupied by a mere enumeration of the names of those who have promoted it by their labors and discoveries. Some notion of what botanical literature has become, may be formed from the fact that Pritzel, in his *Thesaurus Litteraturæ Botanicæ* (Leip. 1847–51), enumerates about 15,000 publications.

Von Haller, an anatomist and philosopher, as well as a botanist, was, of all the contemporaries of Linnæus, the only one who could be regarded as his rival. Of all the

botanists of the latter half of the 18th c., the most deserving to be mentioned in the history of the science along with the great Swede, are Bernard de Jussieu, and his nephew, Antoine Laurent de Jassieu, who applied themselves with great earnestness to the study of the natural affinities of plants and the formation of a natural system, a work which Linnæus himself attempted, and of the importance of which he was so sensible, that whilst acknowledging the imperfect success of his endeavors, he declared his resolution to persevere in them to the end of his life. The Jussieus traced the outlines of a system which the greatest botanists since their time have not so much sought to change as to complete. Among those who have labored with greatest success in this work, must be mentioned De Candolle, Fries, Endlicher, Brongniart, Meisner, Von Martius, Lindley, and Brown. The botanist last named acquired by his work on the plants of New Holland, published in 1810, a high eminence, not on account of new plants which he described, but on account of the light which he threw upon the most difficult questions connected with the structure of plants and vegetable physiology. Many remarkable discoveries in vegetable physiology have recently been made by Link, Meyen, Schleiden, Von Mohl, Lindley, and others, some of them affecting what may be called the most fundamental principles of botanical science.

Since the days of Linnæus, great progress has been made in the examination of the B. of particular countries and districts, of which perhaps the least important result has been the discovery of very many plants unknown before. But our limits prevent us from noticing particular works in this department of botanical science, or those of botanical travelers, or of botanists who have devoted themselves to the study of particular groups of plants. And we can merely allude to the scientific associations, continually increasing in number and resources, by which the interests of this science are promoted, and to the magazines and other periodical publications devoted to it. However, we cannot but refer also to what may be deemed by some—but unjustly—matters of comparative insignificance, the introduction of B. into schools, and the publication of many works intended for the use of persons not very scientific. By the introduction of this or any similar branch of science into schools, not only may important educational purposes be served, but the young may be led to form a taste for the science which will impel them to its subsequent prosecution. There are few branches of science so easily made popular as B.; but they very much mistake its nature who suppose it to consist in a mere knowledge of the names of plants, or in a familiarity with the classes of an artificial system. What B. really is, and to what the true study of it tends, is better perceived if we consider that "there is not a flower that blows but has some beauty only unveiled to the minute inquirer, some peculiarity in structure fitting it to its destined place and purpose, and yet not patent to a casual glance." There is perhaps no branch of science which demands more than B. the application of the highest mental powers; and like every other, to him who truly prosecutes it—whether little or much—it brings in due measure an immediate reward in his own improvement and delight.

We proceed to exhibit an outline of the Linnæan system, the only artificial system which it appears necessary further to notice, and of the natural system by which it has been to a great extent superseded. The Linnæan system, however, is not entirely artificial. Its foundation may be said to be laid in the perfectly natural distinction between Phanerogamous and Cryptogamous plants—the former of which Linnæus divided into 23 classes; whils the constituted the latter, corresponding to the Acotyledonous plants of Jussieu, into his 24th and last class, *Cryptogamia*. In the other classes, he took the characters from the parts of fructification: this he defined as having no stamens or pistils distinctly visible, and gave it a name, *Cryptogamia* (Gr. *kryptos*, concealed, and *gamē*, marriage), in accordance with this definition, modestly refraining from a confident assertion of the absence of stamens and pistils. Of the 23 classes of phanerogamous or phenogamous plants (Gr. *phaneros*, manifest, and *phaino*, to show), the characters of all are taken from the stamens; and those of Classes I. to XI., simply from the number of them; these classes, however, not including plants exhibiting the peculiarities with reference to which the remaining classes are constituted. Thus Class I., *Monandria* (Gr. *monos*, one, *aner*, a male), consists of plants the flowers of which have only one stamen; Class II., *Diandria* (Gr. *dis*, twice), of those with two stamens; Class III., *Triandria* (Gr. *treis*, three), of those with three stamens, and so on; Class IV., *Tetrandria* (Gr. *tetras*, four times); Class V., *Pentandria* (Gr. *pente*, five); Class VI., *Hexandria* (Gr. *hex*, six); Class VII., *Heptandria* (Gr. *hepta*, seven); Class VIII., *Octandria* (Gr. *octo*, eight); Class IX., *Enneandria* (Gr. *ennea*, nine); Class X., *Decandria* (Gr. *deka*, ten)—until, in Class XI., *Dodecandria* (Gr. *dodeka*, twelve), the number of the stamens is less definitely fixed, and plants are included in it having more than ten, and fewer than twenty stamens. Then follow two classes—Class XII., *Icosandria* (Gr. *eikosi*, twenty), and Class XIII., *Polyandria* (Gr. *polys*, many)—which have numerous stamens, but differ in their being inserted on the calyx in the former class, and on the receptacle in the latter, characters essentially natural, as are those also of most of the remaining classes. Classes XIV., *Didynamia*, and XV., *Tetradynamia* (Gr. *dynamis*, power), are distinguished by having the stamens of different lengths—the former having two long and two short stamens, the latter, four long and two short. Class XV. agrees with the great natural order *Cruciferæ*. Class XVI., *Monadelphia* (Gr. *adelphos*, a brother), has

the stamens united by the filaments in one bundle; Class XVII., *Diadelphia*, has the filaments united in two bundles, or one free and the rest united; Class XVIII., *Polyadelphia*, has them united in more than two bundles. In Class XIX., *Syngenesia* (Gr. *syn*, together, and *genesis*, generation), the stamens are also united, but by the anthers instead of the filaments. This class nearly agrees with the great natural order *Compositæ*, and consists chiefly of plants having compound flowers. Class XX., *Gynandria* (Gr. *gyne*, a female), consists of plants in which the stamens grow out of, or are united with the pistil. Class XXI., *Monœcia* (Gr. *oikos*, a house), consists of plants having the stamens and pistils in different flowers on the same plant; Class XXII., *Diœcia*, of those which have the male and female flowers on different plants; Class XXIII., *Polygamia* (Gr. *polys*, many, *gamos*, marriage), of those having the stamens and pistils in the same or in different flowers on the same or on different plants.—The classes are divided into *orders*, which are constituted on various grounds. The orders of the first 13 classes are strictly artificial, their characters being found simply in the number of the pistils, according to which they are named *Monogynia* (Gr. *monos*, one, *gyne*, a female), *Digynia*, *Trigynia*, etc.; *Dodecagynia*, including all with 12 to 19 pistils, and *Polygynia*, all with 20 and upwards. The orders of Class XIV. are constituted on entirely different grounds, and are two in number, *Gymnospermia* (Gr. *gymnos*, naked, *sperma*, a seed), and *Angiospermia* (Gr. *angeion*, a vessel)—the former "having naked seeds" (or rather the fruit formed of 4 *achenia*), the latter having the seeds in a capsule. The orders of Class XV. are in like manner founded upon the fruit; those of Classes XVI., XVII., and XVIII. upon the number of the stamens; as are also those of Classes XX., XXI., and XXII.; those of Class XIX., chiefly upon characters taken from the florets of compound flowers; those of Class XXIII., upon the circumstance of the hermaphrodite, male and female flowers being found on one, two, or three plants; whilst the orders of Class XXIV. are strictly natural—*Filices* (or ferns), *Musci* (or mosses), *Algæ*, and *Fungi*.

The student may acquire a pretty complete knowledge of the Linnæan artificial system, without knowing much in reality of B.; but, even in beginning to learn the natural system, he must learn some of the first principles of the science. Jussieu followed Ray in dividing plants into three great primary divisions—*acotyledones* (q.v.), *monocotyledones* (q.v.), and *dicotyledones* (q.v.); having respectively no cotyledon or seed-lobe, one cotyledon, and two cotyledons. And, however the names may be changed, or characters assumed from other parts of the plant, these great divisions of the vegetable kingdom still subsist; the *acotyledonous* plants being also, according to characters taken from the stem, *acrogenous* (q.v.); the *monocotyledonous* plants, *endogenous* (q.v.); and the *dicotyledonous* plants, *exogenous* (q.v.). Endlicher is the only botanist of great note who has attempted to make primary divisions of the vegetable kingdom essentially different from those indicated by Ray, and his attempt has not commended itself to general approval. De Candolle gave expression to an important truth in botanical science, when he united the two divisions of monocotyledonous and dicotyledonous plants under the common title of *vascular plants*, in opposition to acotyledonous or *cellular* plants; the vascular plants being the *phanerogamous*, and the cellular the *cryptogamous*. Lindley has endeavored to modify the natural system by dividing the *asexual* or *flowerless* (cryptogamous) plants into the two classes of *thallogens*—with the stem and leaves undistinguishable—and *acrogens*, with the stem and leaves distinguishable, thus limiting the term acrogens to those which have a distinct stem; and in like manner dividing the *sexual* or *flowering* (phanerogamous) plants into five classes, viz., *rhizogens*, with fructification springing from a thallus; *endogens* and *dictyogens*, with fructification springing from a stem, the wood of which is youngest in the center, and the seed with a single cotyledon—the former having parallel-veined permanent leaves, and the wood of the stem always confused; the latter having net-veined deciduous leaves, and the wood of the stem when perennial arranged in a circle around a central pith; *gymnogens* and *exogens*, having the wood of the stem youngest at the circumference, and always concentric, the seed with two or more cotyledons; the former having the seeds quite naked, the latter having them inclosed in seed-vessels. But others generally prefer the simpler division of phanerogamous or vascular plants into monocotyledonous or endogenous, and dicotyledonous or exogenous, the former including Lindley's endogens and dictyogens, the latter his exogens, gymnogens, and rhizogens; although the latter have only a provisional place assigned them, in the absence of well-ascertained views of their structure.

One of the great advantages of the natural system is, that the plants which it brings together are very generally found to agree in their properties, as well as in their structural characters. There are, indeed, species which, in respect of their properties, are anomalous or exceptional in the genera or orders to which they belong; but these exceptions do not invalidate the general rule, according to which we expect the most deadly poisons in the order *loganiaceæ*, bland mucilage and useful fiber in *malvaceæ*, wholesome succulent herbage along with a certain amount of acridity or pungency in *cruciferæ*, etc., etc. The knowledge of the properties of genera and orders is of great use in guiding inquiry, and it is thus that modern science attains in rapid succession to discoveries important in their practical relations.

In the determination of the intermediate subdivisions of the natural system, botanists have not yet been so successful as with regard to these primary divisions, and the ascer-

tainment of the characters and limits of lowest subdivisions—orders, tribes, and genera. Great difficulty has been found in arranging the orders in natural groups, although the attempt, very necessary to a complete system and a just exhibition of nature, has been very assiduously and perseveringly made by Meisner, Endlicher, Lindley, and others of the greatest botanists of the present age.

BOTANY, Fossil, a study almost unknown until the beginning of the 19th c., but now of much importance in connection with palæontology. Besides the usual classification of plants there is generally recognized a sixth class called protophytes, which embrace microscopic eryptogamous plants. These are diatoms and desmids. In botany, as in the animal kingdom, the simplest forms are reckoned the lowest; and, as in the history of animal life, we find that the lower forms of plants appeared first. This is proved by the fact that such forms are found in the oldest fossiliferous strata, the higher groups appearing only in later formations, the present flora being the most highly organized of any. It is known that plants preceded animals, for animals depend upon plants for food, while plants had power to assimilate inorganic substances. With regard to fossil specimens it must be remembered that as the continents came up out of the sea, and as all fossiliferous strata were deposited under water, therefore aquatic plants and animals were more likely to be preserved than animals and plants of the higher lands. In later geological ages the plants have been for the most part terrestrial, while the animals have been in far greater proportion aquatic. Animals also, oftener than plants, have some imperishable portions, and so the specimens of extinct animals are more nearly complete than are those of plants. Remains of marine fossil animals are found in the drift deposited by the sea in successive invasions of the land; and such invasions have been followed by periods of immense duration in which the sea was far away from the invaded land. Within these indefinite periods no record was made, unless in the deep water of the sea or on the shores of other lands invaded during the interim. Therefore for any single country the records of marine life exist in a series of sections separated from each other by blanks covering enormous periods of time. The relations of extinct animals are, consequently, necessarily obscure. But the succession of land plants may have been unbroken, or nearly so; in any event, it is much nearer perfection than in the case of marine animals. It is therefore conceded that the records of plant life found in the sea-shore deposits and the lake beds of the earth will throw much light on the questions of evolution and the origin of species. An idea of the present state of knowledge in respect to fossil botany may be gathered from the following statement of some of the discoveries and deductions thus far made.

The protophytes are identified only with the recent deposits. Their absence from the Palæozoic rocks may be explained by the fact that only such as secreted calcareous or silicious crusts or shells could under ordinary circumstances be preserved. The shields of diatoms are more easily soluble than most forms of silica, and perhaps some of the older beds of flint received their material from this source. Some of the small plants which secrete lime and are commonly called algæ might be considered protophytes. These are and have been abundant in our seas, and may have contributed to the formation of the beds of fossiliferous limestone which make up so much of the Palæozoic rocks. There are tertiary deposits made up of the shields of the diatoms at Monterey, Cal., and near Richmond, Va. The desmids, which are non-silicious, are often found in flint of the cretaceous age, but diatoms under similar circumstances are rare.

The algæ (*hydrophyta*, or *thallogens*) abound in all the oceans and seas, and are discovered in all strata from the lower Silurian upwards. But in the lower Silurian the only plants certainly traced are sea-weeds. Plants found in the Cambrian rocks are described as of the genus *eophyton*. In the Trenton limestone are several species of algæ. Sea-weeds are common in the upper Silurian, the most important being a fossil of the Medina sandstone. In the same strata is the genus of fucoids called *spirophyton*, which runs through the Devonian and carboniferous systems, and is called the "cock's-tail fucoid." In the upper Devonian and lower carboniferous strata is found a group of singular formation called *dictophyton*, and another equally remarkable, called *uphantænia*. In later formations algæ become numerous and gradually approach the forms of the present age. About 50 genera and 150 species have been described.

Lichens, which are so abundant now, are scarcely known in a fossil condition. But as they are exclusively terrestrial plants, they were less likely to be fossilized than the aquatic *thallogens*. It is considered that the lichens were much less abundant in the carboniferous age than now. The only known fossil species were found in amber and in the tertiary lignites. Those in amber are of the same genera and for the most part of the same species with the lichens now common in America and Europe.

Probably because they are terrestrial, and most of them soft and easily perishable, fungi are almost as rare as lichens in the fossil strata. A considerable number of fungi have been described. They are almost all from the tertiary; but some species have been found in the coal-beds of Saxony, and a few have been found in amber. It is believed that some species described are not fungi, but shells, or fish scales.

Plants of the group *anogens*, including *hepaticæ* and the mosses, now form a large part of our vegetation. With an expanse of development as wide as the earth, and in

such vast abundance everywhere, it seems strange that no trace of *anogens* has been found in the older geological formations. But in the tertiary formation both mosses and liverworts are found in considerable abundance, particularly in amber and lignites, and to the formation of the latter they appear to have contributed. Those preserved in amber served to show that nearly the same species are now growing in various parts of Europe. It is believed that the liverwort known as *marchantia palydrosphia* is the most widely distributed of living plants. The absence of *anogens* in the ancient flora shows that those plants, though low in the scale of plant life, are of quite modern date.

There appears to be some reason to believe that the *acrogens* (ferns, equiseta, and lycopods) were the first forms of land vegetation on the earth. They are still represented, but are nowhere predominant, and in general they are insignificant among local living forms. They were formerly much more important, but hundreds of species have died out. Of the three orders united in this class, the lycopods seems to have been the earliest in point of time, and earliest in their subsequent development. They are now represented by various species of lycopodium, or ground-pine, most of which are small. The first lycopods are found in the upper Silurian rocks of Canada, England, etc. These were the forerunners of the large scaly-trunked trees of the carboniferous flora, in which flora they exceeded all other forms of vegetation. At the close of the palæozoic age the lycopods seem to have almost disappeared. No specimen of the group has been found in the mesozoic or tertiary rocks. The ferns made their first appearance in the Devonian strata, and acquired greater importance than they have at the present time. In the middle and upper Devonian tree-ferns were numerous, and of greater dimension than any now living. Of the forms of the upper Devonian and carboniferous strata several hundred species have been described, and there are reasons to believe that they formed a much more highly organized, diversified, and beautiful group of plants than can be found in the fern-flora of to-day. In the mesozoic and tertiary rocks remains of ferns have been found; but ferns reached their highest development in the carboniferous period. The equiseta, which now exist only in the form of scouring rushes, in the carboniferous and Devonian ages grew nearly to the size of forest trees, and in numbers were among the most important of the flora. In the mesozoic ages species of this genus exiisted, having trunks 6 in. in diameter. In the tertiary age the equiseta were larger than now, but were an unimportant portion of the flora of the time. The order of acrogens show a history in contrast with that of other cryptogami. They began very early in the earth's history, acquired a profuse development, and kept their standing through two geological ages. Then that standing was suddenly lost, and thenceforward their course has been downward, until from lordly trees they have degenerated to rushes, and lost all importance in botanical rank and in scientific consideration.

Quite the opposite are the facts in regard to the great group of *endogens*, among which are the grasses, palms, lilies, etc., including many of the loveliest forms of vegetable life. They include also the grains commonly called cereals, and are thus not only ornamental, but highly useful. They are of comparatively modern date. Few traces of them have been found in palæozoic rocks, but they seem to have existed at least as flowering plants in the carboniferous age. In the triassic, jurassic, and cretaceous formations they are represented by many genera. Palms appear in the cretaceous formation, the oldest representative being the fan-palm now growing in the southern United States. In the tertiary era this flora rose to great importance, and remnants are found of many species of grasses, sedges, and lilies. It appears, therefore, that the endogens are of quite modern date, beginning in the mesozoic era, the inferior families coming in at a later period.

The *exogens*, now forming much the larger part of the vegetation of the globe, belong to the present or to the immediately preceding geological era. No actual traces of angiosperms, the highest division of the exogens, have been found further back than the cretaceous rocks. Commencing in that era, they spread with great rapidity, developed in remarkable force and variety, and before the close of the epoch they had become the predominating type of vegetation, which gave the flora of the earth very nearly its present appearance. In the tertiary epoch many additions were made, comprising the most beautiful and useful of flowers and fruits, producing plants useful in supplying the animals then coming to development, and finally for supplying man. There is quite a different history for the inferior order of exogens, the gymnosperms, the conifers, and the cycads. The conifers seem to have been among the first of terrestrial plants, beginning far back in later epochs of the upper Silurian age. In the Devonian they attained large size, as the petrified trunks found in middle Devonian rocks have proved. In the carboniferous age, conifers were abundant, producing forests much like the pine forests of the present day. In the tertiary age, the conifers reached their highest development in the "mammoth trees," the "red wood," etc., of which remarkable specimens are still to be seen in California. The pines and firs began in the cretaceous age, and have since been increasing in importance, at present constituting by far the larger part of the coniferous vegetation of the globe. Yews appeared in the tertiary period, *podocarpus* in the mesozoic, *larix* in the tertiary, *arbor vitæ* in the mesozoic, *taxodium* in the middle tertiary, the ghinko (which has now but a single representative) in the cretaceous. The cycads appeared in the carboniferous age, and in the mesozoic age became one of the

most characteristic forms of vegetation. Then they displaced and succeeded the acrogens of the coal-floras, and gave their name to the "age of cycads," extending from the beginning of the triassic to the middle of the cretaceous age. They were in turn displaced by the conifers. In the tertiary age the cycads filled about the same position as now.

Of the angiosperms much will be found under the title BOTANY (see *ante*). Their history comprises the larger part of modern botany. They appear in vast numbers quite abruptly in the upper part of the cretaceous formation. Many of the genera now living formed the forests of that period, and the fossil remains show that their appearance was much the same as now. Among the living genera represented were the oak, poplar, plane, willow, beech, sassafras, magnolia, fig, maple, walnut, tulip tree, etc. The tulip-tree has but a single living representative, yet the genus began in the cretaceous age, in America; and in the miocene tertiary age a tree nearly like it grew in Greenland, Iceland, and in Europe down to Italy. The sassafras, having now but one species in America and one in the East Indies, dates back to the cretaceous age, and was the companion of the tulip-tree in Greenland and elsewhere. Magnolias, so grand a feature of American forests, were common in Europe during the tertiary period, but none are native there now. The fast-disappearing specimens, with the lone remnants of gigantic growth of the Yosemite, remind us of the magnificent arborescent flora of the American continent in ages long gone by.

It is not easy to define *ages* in botany otherwise than by ages in geology. No trace of plants has been found in eozoic rocks. These rocks, however, contain no animal fossils, and it is supposed that if there had been deposits of either vegetable or animal matter, the metamorphism of the rocks is so absolute that no traces would be likely to remain. But beds of graphite found in the Laurentian rock-beds are by some scientists considered to indicate a vegetable origin; and one writer suggests that they may be of animal origin. Fucoids are said to have been found in the Cambrian rocks in England; and in the same rock in Sweden, and certain rocks in Wales, plant remains described as exogens have been found. Their character, however, is doubtful, and affords no real proof of development higher than that of sea-weeds. Fucoids are abundant in the lower Silurian, but usually with little or no trace of structure. There seems to be no satisfactory evidence of the deposit of land plants in the lower Silurian strata. Coming to the upper Silurian, we find the greater part of the plants to be sea-weeds. But here and there discoveries and indications tend to show the existence of land plants at about the end of the Silurian age. In the Devonian rocks fucoids are common. Tree-ferns have been found in the corniferous limestone of Ohio, indicating the existence of a highly organized flora on the land. In New York, Canada, and elsewhere, remains of an abundant flora have been found in the middle and upper Devonian rocks. The remarkable feature of Devonian flora is the prevalence of conifers and tree-ferns. The vegetation of the carboniferous age (age of coal) is important, but has been often described. More than 500 specimens of plants or parts of plants have been described. Much the greater portion consists of ferns, but few of them were arborescent. Next come the lycopods, then the equiseta. Of the latter group some were arborescent, and some were aquatic. The cycads, also, were represented; and the endogens, the latter by a few flowering plants. Conifers growing to the size of modern pines were abundant, but they were highland trees, and not likely to be found in coal-deposits. Many fossil fruits have been found with the coal plants, such as nuts of conifers and reed-vessels of cycads.

Coming to the triassic flora of the mesozoic age there is a radical change, both with regard to flora and fauna. Ferns were numerous, but different from those found in the coal-beds, and less plentiful. The cycads are the prominent feature of triassic vegetation; they were so numerous and conspicuous as to give rise to the title "reign of the cycads." This branch of fossil botany has not been much studied in America, but some valuable collections have been made. The most remarkable of American plants of this period are cycads, and great monophyllous ferns. In some places petrified trunks of coniferous trees are abundant, proving that forests of very large trees covered some portions of the continent at that period. But so far no traces of angiosperms have been found among triassic plants, nor have any Jurassic plants, so common in Europe, been discovered in this country.

The cydaceous flora appears to have remained with no particular change during the early part of the cretaceous era. About the commencement of the lower cretaceous strata, however, the "reign of angiosperms" began, and in the cretaceous sandstones of New Jersey and of the west the remains of 100 species of arborescent angiosperms have been found, with few ferns and hardly any cycads among them. The facts show that the continent was covered with forests of broad-leaved trees, rivaling in size and beauty those of the present time; that among those old trees were oaks, magnolias, sycamores, willows, beeches, and others now common. The upper cretaceous deposits of Colorado and other territories contain beds of lignite, and many foreign plants. About 250 specimens, of which many are single leaves, have been found. The coal strata of Vancouver's island contain many signs of the leaves of angiosperms.

In the tertiary age, the angiosperms predominate, and the indications are that the flora was derived directly from that of the cretaceous era, the tertiary flora in turn giving birth to that of the present day. No traces have been found in this country of the

flora of Europe of the eocene period. During the miocene period, fan-palms grew as far north as Canada, indicating that the region of the St. Lawrence then had a climate as warm as that of the gulf states at the present time. In the miocene tertiary period, the part of the continent now knows as British America and Alaska was covered with luxuriant vegetation, even to the shores of the Arctic ocean. In Greenland and Alaska many specimens of arborescent plants have been found. The similarity of many of these species to those found in Europe lead to the presumption of a land connection between the two continents; and the similarity of the flora of Japan with that of America would seem to indicate a land connection on that side also. The pliocene flora of America presents no very marked changes from that of the miocene, except in approaching more nearly to the flora of the present time. In the glacial era, the tertiary flora was forced southward, or destroyed. After the modification of temperature, the boreal plants, which in the ice period had covered the lowlands, moved northward or climbed the hills and mountains to find a natural temperature. The kindred character of alpine species in often widely separated places shows this fact.

After the manner of the geologists, the learned in fossil botany may divide the ancient flora into "ages," of which there are four: 1. The *age of thaliogens*, including the Cambrian and Silurian divisions of geology, during which time sea-weeds were almost the only form of plants. 2. The *age of acrogens*, in the Devonian and carboniferous eras of geology, when ferns, etc., attained their wonderful development in size and number. 3. The *age of gymnosperms*, from the beginning of the triassic to the middle of the cretaceous era, when the cycads and conifers were over all the earth, and of greater relative importance than at any time before or since. 4. The *age of angiosperms*, from the middle of the cretaceous to the present time, of course including all existing flora. See PALÆONTOLOGY, *ante*.

BOTANY BAY, a haven of New South Wales, in lat. 34° s., and long. 151° 15′ e., discovered by Cook, on his first voyage, in 1770, and named by him from the great number of new plants in its vicinity—a characteristic, however, rather of Australia in general than of this particular locality. In 1787, it received England's first penal colony in the east; and though it was supplanted the very next year by Port Jackson, a vastly superior harbor immediately to the n. of it, yet it long continued to be the popular designation, not merely of this convict settlement, but of the Australian convict settlements generally. On the shore of B. B. there was erected, in 1825, a column to the memory of that eminent French navigator, the unfortunate La Perouse.

BOTETOURT, a co. in s.w. Virginia, on the James river; intersected by the Atlantic, Ohio and Mississippi railroad; 500 sq.m.; pop. '70, 11,329—3163 colored; in '80, 15,750; the Blue ridge is its s.e. boundary; Middle mountain is on the n.w. border, and the Peaks of Otter are on the Bedford co. line. Cereals and tobacco are the chief productions. Co. seat, Fincastle.

BOTETOURT, SIR NORBORNE BERKELEY, Lord, 1717-70: an English statesman, governor of the colony of Virginia in 1768, dying there two years later. He favored the colonists and opposed parliamentary taxation. He was the last of the barons of Botetourt.

BOTH, JOHN and ANDREW, two celebrated painters, who, being united in their works like Beaumont and Fletcher, are, like them, usually spoken of together, were born at Utrecht, where their father was a painter on glass—John in 1610: the date of Andrew's birth is not known. After studying under Abraham Bloemart, the brothers went to Italy, where they soon won for themselves a high reputation. John painted landscapes, adopting Claude for his model, while Andrew filled in the figures after the style of Bamboccio, and in so careful a manner that the pictures looked like the work of one hand. John's landscapes are characterized by delicious warmth of sky, softness of distance, and general truthfulness to nature; even the different hours of the day may be distinguished in some of his best pictures, so careful are his tints. The works of the brothers are still in great repute, and bring high prices whenever they are offered for sale. One of the brothers was accidentally drowned in a canal in Venice in 1650; the other brother then settled in Utrecht, where he died six years afterwards.

BOTHIE (from the Gaelic *bothag*) signified originally a humble cottage or hut, but for a considerable number of years the term has been more popularly applied to a barely furnished, generally uncomfortable habitation for farm-servants. Though bothies are principally confined to the eastern and north-eastern counties of Scotland a few have spread over a much wider area. The bothie, strictly speaking, of modern times is situated either under the same roof as the stable, or, oftener, at a short distance from the steading. While the cubic contents are invariably disproportionate to the number of inmates, the furnishings are of an uninviting, sometimes actually repulsive character. One long roughly manufactured table, a few long stools, a chair or two, a number of victual bunks, a few wooden cups or bowls, and a pot or two, constitute the bulk of the fittings. The inhabitants are generally unmarried men, who frequently have their own food to prepare. Some of the larger farmers afford a woman for cooking and cleaning the bothie. Huddled together in this unnatural way, without the refining influence of the heads of families or the female sex, it is not surprising that the inhabitants of the

bothie often acquire boorish and sometimes immoral habits. Public moralists decry the bothie vehemently. The men themselves do not raise their voice loudly, if at all, against it; and some influential farmers (amongst whom was the late Mr. M'Combie) seem to regard it, if an evil, as a necessary one, in present circumstances. The bands of Irish and Highland females living together in the e. Lothian cottages, may be ranked as bothieites, and do not strengthen the argument for the general system. Though the bothie system is only one of several foul blots on the agricultural escutcheon affecting the laborers, it is diminishing, as farm cottages increase, and must soon, under the pressure of public opinion and the growing desire for social elevation, be reduced to a minimum, if not entirely abolished.

BOTHNIA, the name formerly given to a country of northern Europe, extending along the e. and w. shores of the gulf of Bothnia (q.v.), the eastern portion now being comprised in Finland (q.v.), and the western forming the Swedish governments of Pitea and Umea.

BOTHNIA, GULF OF, the part of the Baltic sea which lies to the n. of the isle of Aland, having on its eastern shore Finland, on the western, Sweden and Lapland, with Tornea for its northern limit. It extends from lat. 60° to 66° n., and long. 17° to 25° 35′ e., its greatest length being about 400 m., and its average breadth 100 m. Its depth varies from 20 to 50 fathoms, but both along its shores, and in the middle, are many small islands, sand-banks, rocks, and cliffs, called *skaers*, which render the navigation difficult; though on the whole it is less dangerous than other parts of the Baltic, and has many good harbors. The rivers which fall into this gulf, both from Sweden and Finland, are numerous; and the waters of the gulf itself are but slightly salt. In winter, it is usually so hard frozen that it can be crossed by sledges.

BOTHRIOCEPH'ALUS (Gr. *bothrion*, a little pit, and *cephale*, a head), a genus of intestinal worms, belonging to the order of *cestoid worms* (q.v.), and included, until recently, in the genus *tænia* (tape-worm, q.v). The head in this genus is not furnished with four sucking disks, as in the true tape-worms, but with two lateral longitudinal hollows, which seem to serve only for adhesion by means of a partial vacuum, and to have nothing to do with nutrition. Nourishment is indeed supposed to be obtained entirely by the imbibing of fluids through the entire length of the worm; and whilst this process of imbibing takes place, there is also an exudation—as *exosmose* accompanies *endosmose* (q.v.) in the roots of plants—of peculiar oleaginous drops, which may probably be in part the cause of the injurious effects produced by these worms upon the health of the animals infested by them. The species of B. are very abundant in predaceous fishes, and occur more sparingly in fish-eating birds; the immature and sexless young being found in fishes and inferior aquatic animals, either in peculiar cysts, or in the intestinal canal. Sticklebacks are often seen distended to an unusual size by a species of B. which lies free in the cavity of the abdomen; but in the stickleback its joints and sexual organs always remain undeveloped; it is only when the stickleback has been digested in a bird's stomach, that the B., released, and finding itself at last in suitable circumstances, acquires its mature form, becoming an inhabitant of the bird's intestines. Only one species of B. occurs in man, *B. latus*, which is at once distinguished from the common tape-worm by the different form of its segments, but has been often confounded with another species of tape-worm, under the name of broad tape-worm. The segments are much broader than they are long, and each contains organs of reproduction. The worm is strictly androgynous. It is scarcely known in Britain, but is of frequent occurrence in some parts of Europe, and sometimes attains a length of 15 ft. or upwards; and a coil of these worms is not unfrequently expelled at once from the patient. The B. is, however, much more easily expelled than the true tape-worms. The same means are employed. The geographical distribution of this worm, which is most frequent in low marshy countries, has led to the conjecture, that its youngest brood may inhabit some of the smallest aquatic animals, and that it may find its way into human beings by their eating salads, fruit which grows near the ground, or the like.

BOTHWELL, a co. in Ontario, Canada, on lake Erie and St. Clair river; traversed by the Great Western railway; 547 sq.m.; pop. '71, 20,701. Petroleum is one of the chief productions.

BOTHWELL, a small village in Bothwell parish, in Lanarkshire, on the right bank of the Clyde, 8 m. e.s.e. of Glasgow. The river is here crossed by the celebrated bridge, the place of the bloody encounter between the Covenanters and Monmouth in 1679, when the former were defeated. Near the village are the magnificent Norman ruins of Bothwell castle, at the foot of which the Clyde washes the fine scenery of "Bothwell bank," celebrated in Scottish song. Pop. '71, 1209.

BOTHWELL, JAMES HEPBURN, fourth earl of, was b. about 1526. On his father's death in 1556, he succeeded to the great inheritance which made the earl of Bothwell the most powerful noble in the s. of Scotland. At first, he opposed the reformation party, but on their accession to power he easily changed his politics; and, in 1561, formed one of the deputation of lords sent to convey the youthful queen of Scotland to her kingdom. He was shortly after made a privy-councilor; but his violence and misconduct soon became intolerable, and he was ordered to quit Edinburgh. In Mar.,

1562, he and the earl of Arran were committed to the castle for conspiring to seize the queen's person. B. made his escape, was recaptured at Holy island, again got free, and sailed to France. He speedily returned, but finding Moray close on his trail, embarked for the continent. Not appearing at his trial, he was outlawed. In 1565, after the queen's marriage with Darnley, he re-appeared, and having strongly espoused her cause against Moray and his party, was suddenly restored to favor, and even high influence. In Oct., 1566, while performing a judicial tour in Liddesdale, he was attacked and wounded, and the queen manifested her interest in his danger by riding 20 m. and back to see him, a journey which brought on a dangerous fever. At Craigmillar, some time after, B. attempted, unsuccessfully, to overrule her objections to a divorce from Darnley. A more thorough-going method was open to him, and on the night of 9th Feb., 1567, Darnley was blown up at the Kirk of Field. The public voice loudly charged B. with the murder, but he was not formally indicted till the 28th March. He came to the trial attended by 4000 followers, and received an easy acquittal. Two days after, he carried the sword of state before the queen at the opening of parliament, and at its close, all his lands and offices were confirmed to him, in consideration of his "gret and manifold gude service done and performit not only to her hienes' honour, weil, and estimatioun, but alsua to the comone weil of the realme and leiges thairof." At a supper on the following night, the leading nobles signed a bond approving of Bothwell's acquittal, and commending him as a fit husband to the queen, pledging themselves to stand by him. On the 26th April, B., accompanied by a strong force, carried off the queen to Dunbar castle; on the 6th May he was divorced from his wife; and on the 15th his marriage with Mary was solemnized at Holyrood. He had previously been created duke of Orkney. His guilty triumph was very short; the wrath of the nation was roused; at the end of one month, Mary was a prisoner in Edinburgh, and B., pursued in his voyage to the Orkneys, fled to Denmark. There he was seized, imprisoned, and died in 1576, leaving no heirs. His titles and estates were forfeited to the crown.

BOTOCU'DOES, or AYMBORES, a Brazilian people on the Rio Doce and Rio Parde, who are said to resemble Chinese. There are about 4000 of them; brave but treacherous, and troublesome to the government. They have the hideous custom of wearing a block of wood in the lower lip, forcing the lip to project 2 or 3 in. in a right angle to the jaw; they also wear great wooden ornaments in their ears. All the B., except a few who are civilized, go naked.

BOTONÉ, or BOTONNY. In heraldry, a cross botoné is a cross of which the ends are in the form of buds or buttons.

BOTOSHAN', or BOOTUSHA'NI, a city in Roumania, 60 m. n.w. of Jassy; pop. '66, 28,117. It contains a hospital and many churches and synagogues, and is the seat of an important fair.

BO TREE, the name given in Ceylon to the PEEPUL (q.v.) of India (*ficus religiosa*). It is held sacred by the Buddhists, and planted close by every temple, attracting almost as much veneration as the statue of Buddha itself.—The B. T. of the sacred city Anaradjapoora, is in all probability the oldest tree in the world, of which the age can be ascertained by historical evidence. It was planted in 288 B.C., and sir James Emerson Tennent, in his work on Ceylon, published in 1859, gives reasons for believing that the tree was then really the wonderful age of 2147 years; and refers to historic documents in which it is mentioned at different dates, as 182 A.D., 223 A.D., and so on to the present day. This tree is invested, in the estimation of the Buddhists, with wonderful sanctity. "To it," says sir James, "kings have even dedicated their dominions in testimony of their belief that it is a branch of the identical fig-tree under which Gotama Buddha reclined at Uruwelaya when he underwent his apotheosis." Its leaves are carried away as treasures by pilgrims; but it is too sacred to be touched with a knife, and therefore they are only gathered when they fall.

BO TREE, PEEPUL, the sacred fig-tree of Ceylon and Hindustan, greatly venerated by Buddhists. It bears a small fig of litte value, but its sap is rich in caoutchouc. The tree is a favorite haunt of the lac insect, and a great quantity of lac coloring matter is gathered from the branches. There is a B.T. in Ceylon which it is supposed was planted nearly three centuries before our era.

BOTRY'CHIUM, a genus of ferns, of the division *ophioglossea*, having the *spore-cases* (or seed-vessels) distinct, sub-globose, clustered at the margin, and on one side of a pinnated *rachis* (an altered frond), 2-valved, without any trace of an elastic ring, and opening transversely. The only British species *B. lunaria*, MOONWORT, a little plant, pretty frequent in dry mountain pasture, but not applied to any particular use. A species more worthy of notice is *B. virginicum*, of which the geographical distribution is very remarkable. It abounds in many parts of the southern states of America, the mountains of Mexico, etc., in Australia, in some parts of Asia, as the Himalaya mountains; and is found also in Norway, although in no other part of Europe. It is large and succulent, and is boiled and eaten in the Himalaya, in New Zealand, etc. It is called RATTLESNAKE FERN in some parts of America, from its growing in places where rattlesnakes are found.

BOTRY'TIS, a genus of fungi, of the division *hyphomycetes*, containing many of the plants commonly called MOLD (q.v.) and MILDEW (q.v.). The plants consist of a *mycelium* (see FUNGI) of more or less entangled threads, which are composed of rows of cells, with shoots of the same nature rising up from them, and bearing the fructification at their extremity. Some of them attack the fibers of vegetable fabrics, such as linen and cotton, in damp places, the decayed stems of plants, decaying fruit, etc. Some are found on living animal tissues, whether always previously diseased or not is a question still unsettled, although the probability appears to be that they make their appearance only where there is already disease, which, however, they modify or entirely change. A remarkable species of this section of the genus is the MUSCARDINE (q.v.), or SILKWORM ROT.—A section of the genus, in many respects of particular interest, and which some botanists have endeavored to separate into a distinct genus, consists of species which grow among living vegetable tissues. The threads of the *mycelium* creep among the loose cells of the under side of the leaves, and send up their fertile shoots through the stomata (see LEAVES and STOMATA). Many of the species are extremely destructive to particular plants, as *B. parasitica* to turnips. But *B. infestans* is, of all the species, the subject of greatest interest, the potato disease being confidently ascribed to it by some observers, among whom is sometimes named Mr. Berkeley, and the opinion of no living botanist is entitled to greater respect upon a point connected with this branch of the science; but Mr. Berkeley himself states his opinion very guardedly. "The decay of the leaves and haulm in the potato murrain," he says, "is certainly due to *botrytis infestans;* and its appearance in the diseased tissues of the tubers, when exposed to the air, makes it at least probable that it has a close connection with that destructive murrain, which, in many instances, does not appear alone, but accompanied by other diseases. The mold may be traced spreading round the edges of the brown spots on the leaves, and soon destroying the tissue on which it was developed." (Art. *Botrytis* in Morton's *Cyclopædia of Agriculture.*) The destruction results not only from the fungus feeding upon the juices of the plant, but from its obstructing the elaboration of the sap and all the processes which in a healthy state take place at the surface of the leaf.—The whole subject of the propagation of fungi of this kind is involved in great obscurity. They are indeed seen to produce seeds (or spores) in great abundance, but the doubtful question is, how these reach the place where they are to grow, whether from the surface of the leaf, to which it is objected that the stomata are too small to admit them, or, as Mr. Berkeley thinks, from within the plant. See POTATO DISEASE.

BOTTA, CARLO GIUSEPPE GUGLIELMO, an Italian poet and historian, b. in 1766 at S. Giorgio del Canavese, in Piedmont. He studied medicine in Turin. In 1794, he became a physician to the French army, and in 1799, he, Carlo Aurelio de Bossi, and Carlo Giulio, were appointed the provisional government of Piedmont. They were known as *Il triumvirato de tre' Carli.* After the battle of Marengo, he became a member of the Piedmontese Consulta. In the *Corps Legislatif*, he gave offense to Napoleon, by designating his government as despotic. In 1830, he was allowed to return to his native town, and was pensioned by Charles Albert. He died in Paris, 10th Aug., 1837. Of his works of earlier date, the following may be mentioned, in which his admirable historic style is gradually developed: *Description de l'Ile de Corfu* (2 vols., Par. 1799); *Souvenirs d'un Voyage en Dalmatie* (Tur. 1802); *Précis Historique de la Maison de Savoie* (Par. 1803); *Histoire de l'Amérique* (Par. 1809). His epic poem in twelve books, *Il Camillo o Vejo Conquistata* (Par. 1816), was also favorably received. But his most important works are his *Storia d'Italia dal* 1789 *al* 1814 (Par. 1824), which has gone through many editions, and for which he received the quinquennial prize of 1000 Tuscan dollars, founded by the grand duke Ferdinand II. in 1814, in the *Accademia della Crusca* at Florence; his *Histoire des Peuples d'Italie* (3 vols., Par. 1825), in which he denies to the Christian religion and to philosophy the credit of having civilized Europe, and ascribes it to the restoration of learning; and the *Storia d'Italia dal* 1490 *al* 1814 (20 vols., Par. 1832), which consists of Guicciardini's work (1490–1534), Botta's continuation of it (1535–1789), and the above-mentioned *Storia d'Italia.*

BOTTA, PAUL EMILE, a distinguished French archæologist and traveler, the son of the preceding, was b. in 1805. While yet young, he undertook a voyage round the world, and remained long about the western coasts of America, where he zealously collected treasures of natural history. In the year 1830 he went to Egypt, where he entered into the service of Mehemet Ali as a physician, and in this capacity accompanied the Egyptian expedition to Sennaar. Here he formed a very considerable zoological collection, with which he returned to Cairo in 1833. The French government now appointed him consul in Alexandria, from which he undertook a journey to Arabia, the results of which he gave to the world in a work entitled *Relation d'un Voyage dans l'Yémen, entrepris* 1837, *pour le Muséum d'Histoire Naturelle de Paris* (Par. 1844). From Alexandria the government sent him as consular agent to Mosul, and at this place, at the instigation of the German orientalist Julius Mohl, he commenced a series of discoveries which form an epoch in archæological science. Early in the spring of 1843, B. began his diggings in the heaps of ruins near the Tigris, for monuments of Assyrian antiquity, and the *Journal Asiatique* soon contained accounts of the success with which his enterprise and perseverance were rewarded, and also disquisi-

tions on the extremely difficult subject of the cuneiform writing of the Assyrians, which afterwards appeared as a separate publication under the title, *Memoires de l'Ecriture Cunéiforme Assyrienne* (Par. 1848). The French government took up the matter warmly; a practiced draughtsman was sent out for the purpose of making sketches upon the spot of the sculptures on alabaster, so apt to fall to pieces; and a commission of learned men was appointed, for the purpose of conducting the publication of a magnificent archæological work, which shortly afterwards appeared under the special superintendence of B. himself, with the title, *Monument de Ninive, découvert et décrit par Botta, mesuré et dessiné par Flandin* (Par. 1849–50). In 1848, he published the *Inscriptions découvertes à Khorsabad*. In 1846, B. was appointed consul at Jerusalem, and in 1857 at Tripoli. He returned to France in 1868, and died at Achères, near Poissy, in 1870. Although in abundance of results B. was far exceeded by Layard (q.v.), yet he certainly deserves the praise of having laid the foundation of Assyrian archæology. See ASSYRIA.

BOTTA, VINCENZO, PH.D., b. 1818, in Piedmont; professor of philosophy in Turin, and in 1849 a member of the Sardinian parliament. He came to the United States several years ago, and became professor of the Italian language and literature in New York university. He is the author of *The American Question, Discourse on the Life of Count Cavour, Dante as a Philosopher, Patriot, and Statesman*, etc.

BOTTARI, GIOVANNI, a learned Italian prelate, was b. at Florence, Jan., 15, 1689. He studied ancient literature and eloquence under Biscioni, and subsequently applied himself to mathematics, philosophy, and theology. He soon obtained a great reputation for the delicacy and purity of his style. The Della Crusca academy intrusted him with the care of a new impression of its famous dictionary. This extensive work occupied B. and his collaborateurs several years, and proved of extreme service to the Italian language. In 1730, he went to Rome, where he was made professor of ecclesiastical history and of controversy in the college of La Sapienza. He also took part in the labors of the geometer Manfredi, when the latter was engaged in determining the level of the Tiber. Clement XII. appointed him librarian of the Vatican, and Benedict XIV. canon of Santa Maria Transteverine. He died at Rome, 3d June, 1775. The works of which B. was either the author or editor are very numerous; the principal are his edition of *Virgil* from the Vatican MS.; his elaborate treatises on the catacombs of Rome and on the Vatican; his *Del Museo Capitolino;* and his dissertations on Dante, Boccaccio, and Livy.

BÖTTGER, or BÖTTCHER, or BÖTTIGER, JOH. FRIEDR., by whom the art of porcelain manufacture was very much improved in Germany in the beginning of last century, was b. in 1681 or 1682 at Schleiz, in the territory of Reuss. His father was master of the mint at Magdeburg and at Schleiz. He was apprenticed to an apothecary in Berlin, but became an enthusiast in the search for the philosopher's stone, for which he neglected everything else, thereby involving himself in many difficulties, and incurring the displeasure of the authorities, so that he was obliged to flee from Berlin, to escape the risk of being punished as an adept. He found protectors and patrons at the court of Saxony, and received large sums to enable him to prosecute his experiments in alchemy. Disappointment ensuing, as he did not succeed in making gold, he was called upon to reveal his secret in writing, and handed in a manuscript full of mystical nonsense, but in which he expressed himself with the air of one completely master of his subject. The king, however, was dissatisfied with this production, of which he appreciated the worthlessness, and readily consented to a request of the count of Tschirnhausen, who desired to avail himself of the skill which he believed B. really to possess, for experiments upon clays, with a view to the manufacture of porcelain. B. was compelled, accordingly, to enter upon these experiments, of which the celebrated Meissen (q.v.) porcelain was the result. See POTTERY. But as a security against the revelation of the art of making it, he and his assistants were treated as prisoners, and when Saxony was invaded by Charles XII. of Sweden in 1706, they were secretly removed from Dresden to Königstein. His success was, however, rewarded with large presents, which he soon squandered. He died on 13th Mar., 1719.

BOTTICELLI, SANDRO (for ALESSANDRO), b. 1447; a Florentine painter, called one of the most original and fascinating of that school. He was the son of Mariano Filipepi, but took the name B. from a goldsmith with whom he served when a boy. From the goldsmith he went to study under the painter Lippo Lippi, after whose death he worked independently. All of B.'s creations are colored with an expression of eager and wistful melancholy, of which it is hard to penetrate the sense, and impossible to escape the spell. He was an artist of immense invention and great industry. In color B. was rich and fanciful, often using gold to enrich the lights on hair, tissues, and foliage with exquisite effect, and no one ever painted flowers with more inspired affection. The date of his death is unknown.

BÖTTIGER, KARL AUGUST, one of the most erudite and thoughtful archæologists of Germany, was b. 8th June, 1760, at Reichenbach, in Saxony. He studied at Leipsic. In 1791, chiefly through the influence of Herder, he was appointed director of the gymnasium, and consistorial councilor at Weimar. Here he enjoyed the stimulating society of

Schiller, Herder, Wieland, Goethe, and others. His literary activity at this period was prodigious. He edited several journals, and wrote multitudes of reviews, biographical notices, etc., for the *Allgemeine Zeitung*. In 1804, B. was called to Dresden, where he began to deliver lectures on special branches of classical antiquities and art. The result of these was: *Discourses on Archæology* (Dresden, 1807); *On Museums and Collections of Antiques* (Leip., 1808); *The Aldobrandinian Marriage Festival* (a mythico-allegorical interpretation of a picture discovered by a member of the Florentine family of Aldobrandini, representing a Roman marriage,—Dresden, 1810); *Thoughts on the Archæology of Painting* (Dresden, 1811); and the *Mythology of Art* (Dresden, 1811). In 1814, appeared his *Lectures on the Dresden Gallery of Antiques* (Dresden); in 1821–25, his *Amalthea*, or *Museum of Mythological Art*, etc. (Leip.); and in 1826, his *Thoughts on Mythological Art* (Dresden and Leipsic). In 1832, B. was elected a member of the French institute. He died 17th Nov., 1835. His works, both in Latin and German, have been collected and edited by Sillig.

BOTTLE (Fr. *bouteille*, which is the dim. of *botte* or *boute* [allied to Eng. *butt*], a vessel), a vessel generally of a round shape, with a narrow neck, for holding liquids. Bottles are now usually made of glass or earthenware; but the first bottles were made of the skins of animals, mostly goats—of this kind were the bottles spoken of in Scripture. Skin bottles are still used in southern Europe for the transport of wine, and by tribes of Africa and Asia for carrying water. The ancient Egyptians made bottles of most elegant form and exquisite workmanship of alabaster, stone, gold, ivory, and other substances. The Italian peasants carry, slung round their necks, bottles made of the rind of the gourd, which, when dry, is as hard as wood. Bottles made of glass will be treated of under Glass.

BOTTLE CHART, Bottle Papers. A bottle chart purports to show the track of sealed bottles thrown from ships into the sea. It is a well-known practice to throw sealed bottles containing some intelligence into the sea during long voyages, in the hope that these fragile messengers may be picked up, and their intelligence reach its proper destination. The frequency of these instances at length led to the inference, that by such means the determination of currents might be illustrated. Lieut. Becher, an English naval officer, has the merit of having constructed, in 1843, a chart of bottle-voyages in the Atlantic, his facts being drawn from the numerous cases that had occurred. The time which elapses between the launching of the bottle from the ship and the finding it on shore, or picking up by some other ship, has varied from a few days to sixteen years; while the straight-line distance between the two points has varied from a few m. to 5000 miles. Of the actual length of the curved line followed by the bottle, little or nothing is known; but some are believed to have exceeded 8000 miles. The B. C. has been re-edited and re-engraved from time to time, and published in the *Nautical Magazine;* it is marked by several hundred straight lines, each drawn from the lat. and long. of immersion to the lat. and long. of the finding.

BOTTLE-GLASS. See Glass.

BOTTLE-GOURD, *Lagenaria*, from Lat. *lagena*, a bottle, a genus of plants of the natural order *cucurbitaceæ* (q.v.), nearly allied to the gourd (q.v.) genus (*cucurbita*), in which it was until recently included. One of the most marked distinctions between them is the very tumid border of the seeds of the bottle-gourds, which have also all the anthers separate, and have white flowers, whilst those of the gourds proper are yellow. The common bottle-gourd, or false calabash (*lagenaria vulgaris*), is a native of India, but is now common almost everywhere in warm climates. It is a climbing musky scented annual, clothed with soft down, having its flowers in clusters, and a large fruit, from 1 to even 6 ft. in length, which is usually shaped like a bottle, an urn, or a club. The fruit has a hard rind, and when the pulp is removed, and the rind dried, it is used in many countries for holding water, and is generally called a *calabash* (q.v.). The bottle-gourd, in its wild state, is very bitter and poisonous, and even in cultivation, some of its varieties exhibit not a little of the bitterness and purgative properties of colocynth (q.v.). Other varieties, however, have a cooling edible pulp. This is most perfectly the case, in general, with those which attain the greatest luxuriance. The bottle-gourd appears to have been introduced into Europe about the close of the 16th c., but it requires for its advantageous cultivation a warmer climate than that of any part of Britain, where, although it succeeds well enough on a hotbed, it is chiefly known as an object of curiosity. It is, however, much cultivated in warmer countries as an esculent, and is an important article of food to the poorer Arabs, who boil it with vinegar, or make a pudding of it in its own rind with rice and meat.

Another species, *L. idololatrica*, is a sacred plant of the Hindus, much employed in their religious ceremonies.

BOTTLEHEAD (synon. *Bottlenose, Bottle-headed Whale, Bottle-nosed Whale*, or *Beaked Whale*), a cetaceous animal occasionally but rarely met with on the British coasts, and on those of the continent of Europe. It was until recently placed in the genus *delphinus* by naturalists, and is still ranked among the *delphinidæ* or dolphin (q.v.) family; but some of its characters appear to make it a connecting-link between them and the *balænidæ*, or true whales. A new genus, *hyperoödon* (the name of which is derived from the Greek, and refers to the peculiarities of the dentition), has been erected for it;

but unfortunately several specific names have been adopted by different authors—as *H. Butzkopf*, *H. bidens*, and *H. Honfloriensis*—to the increase of difficulty and obscurity; whilst it appears that there is only one species to which they equally belong. The B. has the snout produced into a beak, as in the dolphins; the beak is short and strong; the forehead rises suddenly from the beak, and is remarkably elevated, a peculiarity which is owing to large bony crests rising over the bones of the upper jaw. The teeth are only two in number, and are situated in the fore-part of the lower jaw, pointed, but much enveloped by the soft parts, and sometimes completely hidden among them: the palate and upper jaw are furnished with little hard points or tubercles, not one tenth of an inch in height, which, however, have been doubtfully regarded as a kind of false teeth, and by Cuvier as rudimentary vestiges of whalebone. There is a dorsal fin, rather small in proportion to the size of the animal, and placed farther back than in the common dolphin. The blowhole is crescent-shaped, the points of the crescent directed backwards. The skin is smooth and glossy, of a blackish lead color on the back, gradually becoming lighter on the sides, and whitish on the belly. The animal attains a length of about 25 feet.

The B. has occasionally been caught in consequence of its having entered harbors or the mouths of rivers. One was caught above London bridge, and figured and described by Hunter in the *Philosophical Transactions* for 1787. It is impossible that too great attention can be paid to specimens of the rarer cetacea caught or driven ashore on any part of the coast, and it is to be hoped that the obscurity and confusion still so much prevailing in this branch of natural history may soon be removed. Photography seems to afford new facilities for an exact comparison of specimens, of which advantage ought to be taken; and everything capable of being preserved should be so carefully, for the study of naturalists. There is a splendid skeleton of the B. in the museum of the royal college of surgeons, London.

The name BOTTLE-NOSED WHALE has been also given to a species of dolphin (q.v.), *delphinus tursio*, which is occasionally met with on the British coasts.

BOTTLE-NOSE WHALE, or BOTTLEHEAD, *Hyperaodon bidens*, a cetaceous inhabitant of the n. Atlantic, sometimes seen in deep rivers. It is seldom as much as 20 ft. long. The name is sometimes given to a species of dolphin, *delphinus tursis*, inhabiting the same seas.

BOTTLE TREE, *Sterculia rupestris*, a native of Australia, noted for great globular expansion between the ground and the branches; or, where the soil is without rocks, for a trunk in the shape of an ordinary bottle, the limbs appearing to grow from the mouth.

BOTTOM, in naval language, is either the whole ship itself, or that part of it which is under water when laden. Commodities are often said to be imported "in foreign bottoms," or in "British bottoms;" in which cases, the phrase is applied to the whole ship. A "full ship," or a "full B.," denotes such a form given to the lower half of the hull as to allow the stowage of a large amount of merchandise. A "sharp ship," or a "sharp B.," implies a capacity for speed.

The word B. is also applied in an obvious way to the bed of the sea, which is characterized as rocky, stony, sandy, coral, muddy, oozy, etc., bottomed.

BOTTOM HEAT, an artificial temperature in certain soils arising from the fermentation or decomposition of manure, tan bark, leaves, etc., buried for the purpose, and sometimes heated by hot-water pipes. The system is much used in hot-houses and for forcing the growth of tender plants.

BOTTOMRY, BOND OR CONTRACT OF, is a security by which a ship itself is expressly mortgaged and pledged by the owner or master, or *hypothecated* for repairs to the ship, or for money advanced for its outfit, or otherwise with relation to it. It is called a security by *B.*, because the bottom or keel of the ship is figuratively used to express the whole of it. The loan or debt is repayable only in the event of the ship's safe arrival at the port or destination; and in consideration of this risk, the lender or creditor exacts a premium, the amount of which depends on the nature of the adventure. If the ship be totally lost, the lender loses his money; but if she returns safely, he recovers his principal, together with interest at the rate agreed upon. These contracts are not treated as ordinary mortgages, and preferred according to the order of date; but inversely, the latest is preferred to the preceding, because it is presumed that the last loan saved the ship, and in all cases necessity alone is the condition of the contract.

Such, generally, is the law of Great Britain; but the French law appears to be different. By that system, a ship, as movable property, cannot be hypothecated, but remains subject to the debts of the seller until it has made a voyage at sea under the name and at the risk of the new purchaser, unless it has been sold under a decree; and it is a rule that the sale of a ship at sea shall never prejudice the creditors of the seller. See RESPONDENTIA and MERCHANT SHIPPING ACT.

BOTTOMRY (*ante*), a term in maritime law. The act of congress (July 29, 1850) declares bills of sale, mortgages, hypothecations, and conveyances of vessels invalid against persons—other than the grantor or mortgager, his heirs and devisees—not having actual notice thereof, unless recorded in the office of the collector of the customs where such vessel is registered or enrolled, and expressly provides that the lien by bottomry

on any vessel, created during her voyage by loan of money or materials necessary to repair or enable such vessel to prosecute a voyage, shall not lose priority, or be in any way affected by the provision of that act. Seamen have a lien prior to that of the holder of a bottomry bond for their wages in the voyage in which the bottomry was incurred, or in any subsequent voyage; and the owners are also personally liable for seamen's wages. If the holder of the bottomry bond is compelled to satisfy the seamen's lien, he has a right to compensation from the owners, and it has been held that he has a lien upon the proceeds of the ship for his reimbursement.

BOTTS, JOHN MINOR, 1802–69; b. Va.; lawyer and politician, elected to the Virginia legislature in 1833, and several times thereafter; in 1839, chosen to Congress, where, with Henry Clay, he supported the tariff, the distribution of public lands, etc. When president Tyler left the party that elected him, B. left him, although a long-time personal friend. He opposed secession, and was faithful to the union throughout the rebellion. When that ended he became one of Jefferson Davis's bail. He published *The Great Rebellion; its Secret History.*

BOT'ZEN, or BOZEN (Ital. BOLZANO), an important trading t. of the Austrian Tyrol, about 32 m. n.n.e. of Trent. B. is a well-built town, with good streets and arcades; and streams of pure water are conducted through the principal thoroughfares, in little canals. It is protected from the inundations of a mountain-torrent in the vicinity by a strong wall about 2 m. in length. Its situation on the Brenner railway and at the junction of the roads from Germany, Italy, and Switzerland, makes B. an important entrepôt. It has manufactures of silk, linen, hosiery, leather, etc.; and four extensive annual fairs. Wine and fruits in abundance are produced in the environs. Pop. '69, 9357.

BOUCHAIN, a fortified t. of France, in the department of Nord, 12 m. s.e. of Douai, intersected by the Scheldt, and possessing the means of laying the adjacent country under water in the event of an attack. It was taken by the duke of Marlborough in 1711, and recaptured by the French in the following year, to whom it was finally ceded by the treaty of Utrecht. Pop. '72, 1039, who are chiefly engaged in extracting sugar from beet-root, and in refining salt.

BOUCHER, FRANCIS, a French painter of great note in his day, was b. at Paris in 1704, and after studying there under Francis le Moine, he went to Rome to prosecute his art. After a short residence there, he returned to Paris, and on the death of Vanloo, was appointed principal painter to Louis XV. B. was an artist of much ability, and equally facile in the production of figure or landscape pictures—a facility, however, which was very fatal to the claims his genius might otherwise have had on posterity. In many of his paintings, picturesque effect is the only thing sought, no matter at what cost to truth. He has been called the Anacreon of painting, on account of the amorous character of many of his works: mythological and pastoral subjects were also great favorites with him. At his death in 1770, he was director of the French academy.

BOUCHER, JONATHAN, 1738–1804; an English clergyman who came to Virginia as a private teacher, afterwards took orders and was a rector in Maryland just before the revolution; his loyalism induced him to return to England, where he became vicar of Epsom. He published *A View of the Causes and Consequences of the American Revolution,* dedicated to Washington; and a *Glossary of Archaic and Provincial Words.*

BOUCHER, PIERRE, (SIEUR DE BOUCHERVILLE), b. France, 1622, d. Canada, 1717; a pioneer and Huron interpreter who came to America in 1635 and was engaged in the wars with the Iroquois. He was sent by the colony as deputy to France in 1661, about which time he published a *History of New France.* He was ennobled and appointed governor of Three Rivers. He was a brave and good man, the ancestor of some of the most important families in Canada. Shortly before his death he addressed to his children *The Adieus of Grandfather Boucher.*

BOUCHER DE CREVECŒUR PERTHES, JACQUES, 1788–1868; a French archæologist and writer who was employed by Napoleon on several diplomatic errands. He was the author of a comedy, several tragedies, articles in favor of free trade, etc., and was president of the society of emulation at Abbeville. He collected Roman and Celtic antiquities, presenting them to the government, and gained much celebrity by archæological discoveries and by his work *On the Creation.* He wrote also on primitive industries and arts, on antediluvian antiquities and stone implements, besides various works of the imagination.

BOUCHES-DU-RHONE, a department in the s.e. of France, formerly a part of Provence, is situated at the mouth of the Rhone, in lat. 43° 10′ to 43° 56′ n., and long. 4° 13′ to 5° 40′ east. It has an area of 1970 sq.m., and a pop., in '76, of 556,379. It is divided into three arrondissements—Marseilles, Aix, and Arles—which are subdivided into 27 cantons and 108 communes. Through the northern and eastern districts, the maritime Alps, which send out some calcareous ridges southward, slope gently down to the basin of the Rhone. Towards the sea shore, there are several plains of considerable extent. About one-half of the department is under cultivation; heaths, wood, wastes, and water occupy the other half. The Rhone—which between Arles and the sea separates into several branches, forming a delta, called *Ile de la Camargue*—and its affluent, the Durance, are the principal rivers. The department is intersected by several canals of importance, and

the aqueduct to convey the water from the Durance to Marseilles is one of the most extensive works of the kind in existence, being no less than 51 m. long, including 15 m. of tunneling. The *Ile de la Camargue* produces corn and rice, and affords pasture for large numbers of sheep and cattle. The vine, olive, and mulberry also thrive here, and timber is plentiful. The soil in some parts, however, is strongly impregnated with salt. The great plain of Crau, which extends along the eastern branch of the Rhone, is stony and arid, except in a few spots, where the vine and olive are successfully cultivated. Besides the Etang de Berre (q.v.), there are numerous salt-lakes, communicating with the sea by natural or artificial channels. Marble, limestone, and gypsum are found in the Bouches-du-Rhone. Leather, hats, perfumes, soap, olive-oil, vinegar, and chemical products are manufactured; there are extensive brandy-distilleries, sugar-refineries, and salt-works, and the produce of wine is large. B. has an active commerce with the Levant, Africa, Spain, and the West Indies.

BOUCICAULT, Dion, dramatic author and actor, was b. at Dublin on the 26th of Dec., 1822. He was brought up under the guardianship of Dr. Dionysius Lardner, the well-known popular writer on science, and was educated at University college, London. He produced his first dramatic work very early—before he was 19 years old. It was signally successful, and its success determined his career. This was *London Assurance.* It was first performed at Covent Garden theater in Mar., 1841: and it has ever since remained a favorite with play-goers, both throughout Great Britain and in America. Much of the success it had in London must be ascribed to the admirable acting of Mr. Charles Mathews; but it had merits of its own sufficient to secure to it the favorable verdict of the public. The plot was slight, but ingenious; it abounded in comic situations; the dialogue was brisk and sprightly; there was no lack of wit, and there was perhaps somewhat too much of those flippancies and pleasant impertinences which average theater-goers prefer to wit. Once embarked in the career of a play-writer, B. produced piece after piece in rapid succession, and greatly increased the reputation which his first attempt had brought him. *Old Heads and Young Hearts, Love in a Maze, Used Up, Louis XI.,* and *The Corsican Brothers* were among the most popular of his early works. Several of these are still stock pieces at our theaters; and to play-goers, the mere enumeration of their names will show that B. distinguished himself equally in comedy, farce, and melodrama. When he went upon the stage, as he soon did, he added a high reputation as an actor to the reputation he had previously gained as an author. From 1853 till 1860 he was in America, where his popularity was scarcely less than it had been in England. On his return to England in 1860, he produced at the Adelphi theater, a play, *The Colleen Bawn,* which proved among the most successful of modern times, and which, if not the first of a new school, has at least supplied a new descriptive name to our dramatic literature. *The Colleen Bawn* was, happily enough, described as a "sensation drama;" its interest depended largely upon scenery, mainly upon startling incidents and astounding stage-effects. It was not a high kind of work, or fit to stand the tests of a good dramatic piece, as nobody knew better than the author; but it suited the public taste, and the author made a fortune by it. It has been performed at almost every theater in the united kingdom; it had a great run in America too; it was even translated into French, and brought out at the Ambigu theater at Paris. Mr. B. subsequently produced at the Adelphi—of which he was for some time joint-manager with Mr. B. Webster—another "sensation" drama, *The Octoroon,* the popularity of which was only inferior to that of *The Colleen Bawn.* Having quarreled with Mr. Webster, he, in 1862, opened a new theater in London, the Westminster, erected on the site of what had been for generations known as Astley's amphitheater; but this speculation turned out unfortunate, and B. was ruined by it. He afterwards re-established his fortunes by new plays, brought out at the Princess's, the Holborn, and other theaters, in some of which he and his wife—formerly Miss Robertson, a very popular actress—took the leading parts. *The Streets of London, Flying Scud, After Dark,* and the *Shaughraun* have been the most popular of his recent works, all of which are of the "sensation" school, with which, it may be said, he first familiarized the public. He has written upwards of 150 dramatic pieces; and in illustration of the facility with which he has composed works which—all deductions made—are of considerable merit, it may be said that he lately stated to a royal commission that he would undertake to write plays for all the theaters in London. He is undoubtedly capable of writing better works than any he has yet written; but he found the public taste bad, and instead of making thankless attempts at improving it, he has been content to gratify it; and in fact has helped to debauch it. As an actor, B. has always been popular, without attaining to high excellence in his vocation. He wants some natural gifts, without which a man cannot be a great actor; he has an immobile countenance, an indifferent voice, and a too artificial manner. Any success he has had has been gained by the soundness of his judgment and his great cleverness. In 1876 he went to live in New York.

BOUDINOT, Elias, ll.d., 1740–1821; a descendant of the French Huguenots; b. Philadelphia. He practiced law, and was an early advocate of colonial liberty. In 1777, congress made him commissary-general of the prisoners, and in the same year he was chosen a member of congress, becoming president thereof in 1782, and signing the treaty of peace the next year in his official capacity. Washington made him superin-

tendent of the mint in 1796, but he resigned in 1805 and retired from public life. He was a trustee of Princeton college, to which he gave a cabinet of natural history. In 1812, he was a member of the American Board of commissioners for foreign missions, and in 1816 first president of the American Bible society, to both of which he gave large donations. B. was one of the first writers to favor the idea that the American Indians were of Jewish origin, to which end he published *The Star of the West, or an Effort to Discover the Lost Tribes of Israel.* He published the *Age of Revolution, or the Age of Reason an Age of Infidelity*, and other less important works.

BOUDOIR (Fr. *bouder*, to pout—hence a retired corner), a lady's small private apartment, in which she receives only her most intimate friends. Boudoirs became particularly fashionable in France during the reign of Louis XIV., and so continued during the following reign. The example having been set by Madame Pompadour, Madame Dubarri, and other royal mistresses, it became indispensable for every lady of fashion to have her B., which was adorned with the most fantastic luxuriousness.

BOUFARIK, a village of Algeria, in the province of Algiers, and 16 m. s. of Algiers. It is an important military station on the road from Algiers to Blidah and Oran. It has well-frequented markets, and a considerable trade in corn, cotton, olives, oranges, tobacco, raisins, and cattle. Pop. 7650.

BOUFLERS, Louis Français, Duke of, peer and marshal of France, one of the most distinguished generals of his time, was b. in 1644, and was descended from one of the most ancient and noble families of Picardy. He began his military career as a lieut., and rose very rapidly from one rank to another. Under the great Condé, Turenne, Crequi, Luxembourg, and Catinat, he fought with distinction in Germany and the Netherlands. His defenses of Namur in 1695 and of Lilla in 1708, are famous. The siege of the former place, conducted by king William III. of England, cost the allies more than 20,000 men; and although Louis XIV. sent to B. an order written by his own hand for the surrender of the place, yet he did not surrender it until all the means of defense were exhausted. After the defeat of Malplaquet, he led the French army so admirably, that the retreat seemed rather a triumph than the consequence of a lost battle. He was a man of highly honorable and upright character. He died at Fontainebleau in 1711.—His son, Joseph Marie, duke of Boufflers, and also a marshal of France, b. in 1706, d. at Genoa in 1747.

BOUFLERS, Stanislas, Marquis de, commonly styled the chevalier de Boufflers, was b. at Luneville in 1737. He was the son of the marquis Boufflers-Remiencourt, who was capt. of the guard to Stanislas, king of Poland, and his mother was long one of the brightest ornaments of the Polish court. He himself was esteemed one of the most clever and agreeable men of his time. He entered the French military service, and was very soon made governor of Senegal, in which capacity he had the merit of introducing many regulations very useful to the colony. After his return, he devoted himself to the light literature for which the time of Louis XV. was distinguished. He was chosen a member of the national assembly in 1789, in which he displayed great moderation, and made some most judicious proposals; but after the 10th of Aug., 1792, he forsook France. He was hospitably received at the court of Prussia, and received the gift of a large estate in Poland, in order to establish upon it a colony of French exiles. Having returned to France, he again devoted himself, after the year 1800, entirely to literature. In 1804, he entered as an old academician into the institute reórganized by Napoleon. He died 18th Jan., 1815. The monument on his grave bears the following inscription, dictated by himself: *Mes amis, croyez que je dors* (My friends, believe that I sleep). A collection of his works was published after his death (8 vols., Par. 1815). His letters from Switzerland deserve to be particularly mentioned; and from this work an idea may be formed of the amiable character and intellectual liveliness of its author.

BOUGAINVILLE, a bay, island, and strait, so called from the French navigator of the name (q.v.), a contemporary of Cook.—1. *Bay*, in Patagonia, on the n. side of the strait of Magellan, being in lat. 53° 25′ s., and long. 70° 13′ w.—2. *Island*, one of the Solomons, in the w. section of Polynesia, sometimes distinguished from the e. section as Melanesia. It is between lat. 5° 30′ and 7° 2′ s., and in long. 155° e., being mountainous, well wooded, and populous.—3. *Strait*, in the New Hebrides, having Mallicollo to the s.e., and, to the n.w., Espiritu Santo, an islet of 63 m. by 20, which now appropriates the appellation that so long drifted about the ocean in search of a southern continent.

BOUGAINVILLE, Louis Antoine de, one of the most famous navigators of France, was the son of a notary, and was b. at Paris, 11th Nov., 1729, studied there, and attained great proficiency both in languages and science. In 1754, he went as secretary of the French embassy to London. In 1756, he acted as aide-de-camp to the marquis of Montcalm, to whom the defense of Canada was intrusted. At the head of a select detachment he burned an English flotilla; and through his advice and example, a corps of 5000 French in June, 1758, successfully withstood an English army of 24,000 men. In the campaign of 1761 in Germany, he served with distinction. After the peace he entered the naval service, in which he soon signalized himself. After having been obliged to give up a project which he had formed of founding a settlement on the Falkland islands, he under-

took a voyage round the world (15th Dec., 1766, to 16th Mar., 1769) with a frigate and a St. Malo transport, the first voyage round the world which the French ever accomplished. He gave an account of it in his *Description d'un Voyage autour du Monde* (2 vols., Par. 1771–72). Geography and other branches of science were enriched by it with many discoveries. In the North American war, B. commanded several ships of the line, and in 1779 was made *chef d'escadre;* in the following year, he was made a field-marshal in the army. After the outbreak of the revolution, he retired from public service, devoted himself entirely to scientific pursuits, and died 31st Aug , 1811.

BOUGHT AND SOLD NOTES are notes of sale signed by a broker employed to sell goods, and by which the bargain through him is completed. The following is the form of the bought and sold note:

"Sold for A. B., to C. D., 250 firkins butter, at 100*s.* Shipped in the month of July, and payable by bill at two months."

These notes are, in fact, transcripts from books, in which it is the practice of brokers to enter or register their transactions. The bought notes and the sold notes are respectively delivered to the principal parties; and as they contain the essential parts of the bargain, they will suffice, in the absence of a corresponding entry in the broker's books; but if they describe the particulars differently or incorrectly, as one species of goods for another, or erroneously state the terms, no contract arises, and a variation of this nature cannot be corrected by a reference to the broker's book.

In Scotland, there is no necessity for any such signed note, but the contract may be proved by any kind of evidence, verbal (see PAROLE EVIDENCE) as well as written, the only exceptions to this general rule being those contained in acts of parliament relative to ships, literary property, patents, and goods bonded in the queen's warehouses. See BROKER, SALE OF GOODS.

BOUGHTON, GEORGE H., b. England, 1836; came to the United States when three years old, and spent his early years in Albany. He had a talent for drawing, and after finding favor for a few paintings, he went to London for study and practice. Returning to New York, he soon became known as a rising artist, especially by "Winter Twilight," and the "Lake of the Dismal Swamp." To qualify in genre painting, he studied two years in Paris, and in 1861 settled in London, where he makes his headquarters. Besides the pieces mentioned, he has presented "Passing into Shade," "Coming from Church," "Cold Without," "Morning Prayer," "The Scarlet Letter," "The Idyl of the Birds," "The Return of the May-flower," "Puritans Going to Church," "Clarissa Harlowe," etc. "The Idyl of the Birds" is generally considered his best achievement.

BOUGIE, or BOUGIAH, a fortified seaport in the province of Constantine, Algeria; a town of great antiquity, supposed to have been founded by the Carthaginians. Genseric built walls around it and made it for some time his capital. In the 10th c. it was the greatest commercial city of the n. African coast; and in the 12th and 13th c. Italian merchants had their own warehouses and churches there. In the 15th c. it was a haunt of pirates; the Spaniards took possession in the beginning of the 16th c., and the Turks dispossessed the Spaniards in 1555. Now it has a French church, hospital, barracks, magazine, and a fort; and trade in oil, wine, grain, wax, and oranges. Pop. '72, 2820.

BOUGIES are rods of metal or other substances, used for distending contracted mucous canals, as the gullet, bowels, or urethra. See STRICTURE. For the urethra, they are frequently of German silver, or pewter, and vary from .125 to .25 in. in diameter. Still larger sizes are used by many surgeons. The following directions for making common non-metallic B. are taken from South's translation of Chelin's *Surgery:* "A piece of fine linen, which has been already used, 9 in. long, and ¾ in. in width, according to the thickness of the bougie to be made, is to be dipped into melting plaster, and, when a little cooled, spread flat and even with a spatula; it is then to be rolled together between the fingers, and afterwards between two plates of marble, till it is quite firm and smooth. The bougie must be equally thick throughout its whole length to about 1 in. from its point. Bougies are also made by dipping cotton threads into melted wax till they have acquired sufficient size, after which they are rolled between marble plates. Bougies are also made of a material termed 'gum elastic;' and for very narrow strictures, catgut is often used."

BOUGUER, PIERRE, one of the most eminent French mathematicians and natural philosophers of his time, was born at Croisic, in Bretagne, 16th Feb., 1698, and studied in the Jesuit college at Vannes. In 1713, he succeeded his father as professor of hydrography in Croisic, from which he was removed to a similar office at Havre in 1730. In 1729, he published his *Essai d'Optique sur la Gradation de la Lumière.* His researches on other subjects of natural philosophy and astronomy continued to add to his fame; and in 1731, he was made associate geometer of the Academy of Sciences, and promoted to the office of pensioned astronomer in 1735. In that year, also, he was chosen to proceed, along with Godin and De la Condamine, to South America, in order to the measurement of a degree of the meridian at the equator. B. and his companions had to contend with many difficulties, and were more than seven years away from home, during which time B. made valuable observations on the length of the seconds' pendulum at great elevations, the deviation of the plumb-line from a vertical position through the

attraction of a neighboring mountain, the limit of perpetual snow, the obliquity of the ecliptic, etc. He published an account of his labors and those of his colleagues in a magnificent work, entitled *La Figure de la Terre déterminée par MM. Bouguer et De la Condamine* (Par. 1749), which, however, involved him in an unpleasant controversy with de la Condamine concerning their respective shares of merit in the researches in which they had been jointly engaged. B.'s investigations concerning the intensity of light laid the foundation of photometry; and their results, which had been partly exhibited in the optical work already noticed, were more fully embodied in his *Traité d'Optique sur la Gradation de la Lumière*, which was edited after his death by Lacaille (Par. 1760). He invented the heliometer in 1748, which has of late been brought to greater perfection by Fraunhofer. He also published an excellent work on navigation (Par. 1753). He died in 1758.

BOUGUEREAU, GUILLAUME ADOLPHE, b. 1825; a French painter; studied at Paris. He made the mural paintings in the St. Louis chapel of the church of St. Clothilde, and those in the church of St. Augustine. One of his best known efforts is the "Triumph of Venus," which has been widely distributed in lithographs and engravings.

BOUHOURS, DOMINIQUE; a French critic, 1628–1702. He was a Jesuit, and preceptor to the sons of the duke of Longueville, and his first book was a life of the duke. At a later period he had charge of the education of the sons of Colbert, the great minister. Among his works are *Les Entretiens d'Artiste et d'Eugène*, many times reprinted; *La Maniere de bien penser sur les Ouvrages d'Esprit, Remarks and Doubts upon the French Language, Life of St. Ignatius, Art of Pleasing in Conversation, Life of St. Francis Xavier, Pensées Ingénieuses des Anciens et des Modernes.*

BOUILLE, FRANÇOIS CLAUDE AMOUR, Marquis de, a distinguished French gen., was b. in 1739, at the castle of Clusel, in Auvergne, entered the army at the age of 14, and served with distinction in Germany during the seven years' war. In 1768, he was appointed governor of the island of Guadaloupe, and on the seeming approach of war with Britain, he was made governor-general of Martinique and St. Lucia, and commander-in-chief of all the French forces in the West Indies. When th war really broke out in 1778, he took the island of Dominica from the British, the whole garrison falling into his hands. In conjunction with admiral De Grasse, he took Tobago in 1781; and after De Grasse's departure, the British islands of St. Eustatius, Saba, and St. Martin. The humanity and generosity which he displayed were equal to his valor and skill. In 1782, B. captured the islands of St. Christopher's and Nevis. For this he was rewarded with the rank of lieut.-gen. In 1784, he visited England, and was received with extraordinary respect. Louis XVI. nominated him a member of the assembly of notables in 1787–88; in 1790, he was made commander-in-chief of the army of the Meuse, the Saar, and the Moselle. His decision of character prevented the dissolution of the army and the outbreak of civil war; he also quelled the insurrection of the garrison of Metz and of the three regiments at Nancy. For this he received the thanks of the national assembly and of the king. For his share in the attempted escape of Louis XVI. he had to flee from France. He repaired to Coblenz to the king's brothers, and in 1791 attended the conference at Pilnitz. In the same year he entered into the service of Gustavus III. of Sweden, and after the assassination of that monarch, he served in the corps of the prince of Condé. He rejected a proposal which the French princes made to him in 1793, that he should take the chief command in La Vendée; and went to England, where his advice in West Indian affairs was useful to the government, and where he wrote his *Mémoires sur la Révolution Française*—a truthful and useful work, throwing much light on the transactions of that time. He died in London in 1800.

BOUILLET, MARIE NICOLAS, 1798–1864; French metaphysician and for nearly a quarter of a century professor of ethics and metaphysics in various institutions. He was councilor in the university, inspector in the academy, and inspector-general of public instruction; editor of the philosophical writings of Seneca, Cicero, and Bacon, and the first translator into French of the *Enneads* of Plotinus. Much of his time was devoted to important contributions to cyclopædias, and the editing of some of the best of those in the French language.

BOUILLON, a duchy, originally German, in the Belgian part of the grand duchy of Luxemburg, consisting of a woody and hilly district in the Ardennes, about 157 sq. m. in extent, and with a pop. of 21,000. This duchy was the possession of the famous crusader, Godfrey (q.v.) of Bouillon, who, in order to raise money for his crusade, pledged it, in 1095, to the bishop of Liege. It was conquered by France in the war of 1672, and bestowed by Louis XIV., in 1678, upon his grand chamberlain, Latour d'Auvergne. By the peace of 1814, the greater part of it was included in the grand duchy of Luxemburg; and the sovereignty of it passed to the king of the Netherlands, who, in 1821, purchased the proprietary rights from the heir. By the revolution of 1830, B., along with Luxemburg, was separated from the Netherlands, and in 1837 united to Belgium.—The principal town is Bouillon, situated between steep hills on the Semoy, with a strong castle on a rock formerly the residence of the dukes of Bouillon. Pop 4000.

BOUILLON, FREDERIC MAURICE DE LA TOUR D'AUVERGNE, Duc de, son of Henri; 1605–52; brought up a Calvinist. He was in the French military service, but by reason of aversion to Richelieu he went over to the Spaniards. At a later period he became reconciled to Richelieu, and was made lieut.gen.; only a year afterwards he was arrested as one of the Cinq-Mars conspirators, and was in danger of execution, but his wife had possession of Sedan and threatened to surrender the place to the Spaniards unless he should be saved. In Rome, after the death of Louis XIII., he became a Roman Catholic, and had command of the papal forces. In 1649, he returned to France, and joined in the civil war against cardinal Mazarin.

BOUILLON, GODFREY. See GODFREY OF BOUILLON.

BOUILLON, HENRI DE LA TOUR D'AUVERGNE, Duc de, marshal of France; 1555-1623; at first known as viscount of Turenne. He was a convert to Calvinism and a partisan of Henry of Navarre, who, when king, gave him the hand and estate of Charlotte de la Marck, the heiress of the duchy of Bouillon. On the night in which he was to be married, he suddenly left his prospective bride and stormed the fortress of Stenay, then held by the army of Lorraine. He was afterwards complicated in the Biron conspiracy, and took refuge in Geneva. During the Medici regency he was alternately for and against the queen, but amidst his warlike occupations he established a college and library at Sedan. His second wife, a daughter of William prince of Orange, left him two sons, the younger of whom was the celebrated marshal Turenne.

BOUILLY, JEAN NICOLAS, one of the most prolific of French dramatic authors, was b. at Boudray, near Tours, in 1763, and at first studied law, but afterwards devoted himself to belles-lettres. At the commencement of the revolution, he attached himself to Mirabeau and Barnave, and in 1790 produced a drama called *Pierre le Grand* (Peter the great), in which he displayed very revolutionary sentiments. He afterwards filled important public offices in Tours during times of the most dangerous excitement, and conducted himself with great prudence and moderation. He took an active part in the introduction of the system of elementary schools in France. The greater number of his dramatic works were produced in the first decade of the 19th century. Many of them have been translated into other languages. He wrote also tales and other works for young persons, some of which acquired great popularity. He died at Paris, 24th April, 1842.

BOULAC, or BOOLAK, the name of the port of Cairo, is situated on the Nile, about one mile distant from that city, and is supposed to be the site of the ancient Litopolis. It is a crowded town, extremely dirty, with very narrow and irregular unpaved streets. It contains the custom-house and warehouses of Cairo, factories for spinning, weaving, and printing cotton, a paper-mill, some good baths, and a weekly newspaper. Pop. about 14,000.

BOULAINVILLIERS, HENRY, Count, an eminent French author, descended from an ancient family in Picardy, was b. 11th Oct., 1658, at St. Saire, in Normandy. After studying at the college of Juilly, he embraced the military profession, but afterwards resigned it, and devoted himself to the investigation of the genealogy of the ancient families of France. He regarded the feudal system as the most perfect creation of human genius and wisdom, and his writings are pervaded by the most extreme aristocratic sentiments. They were only circulated in manuscript during his life, and first published after his death, which took place on 23d Jan., 1722. The most valuable of them are his *Histoire de l'Ancien Gouvernement de France* (3 vols., Hague, 1727), his *Histoire de la Pairie de France et du Parlement de Paris* (2 vols., Lond. 1753), and his *Abrégé Chronologique de l'Histoire de France* (3 vols., Hague, 1733). His philosophical writings have long ceased to have any interest, and the prejudices which appear in his historic works may afford amusement to his readers; but he deserves to be remembered as one of the first laborious investigators of the facts of history.

BOULAY DE LA MEURTHE, ANTOINE JACQUES CLAUDE JOSEPH, Count, a statesman of the French empire, was b. in 1761 at Chaumousey, a village in the Vosges. He espoused the cause of the revolution, but held moderate principles. In 1797, he was elected to the council of five hundred, in which he became the declared opponent both of Jacobinism and of the despotism of the directory. He supported the *coup d'état* of the 18th Brumaire. Under the empire, he accepted the post of president of the legislative section of the council of state, in which capacity he had an important part in the preparation of the *Code Civil*. He afterwards labored with extraordinary zeal and energy in the administration of the national domains, which he regarded as affording the basis for a regeneration of France. He adhered to the cause of Napoleon with remarkable fidelity. After the second restoration, he was conveyed by the Russians into Germany. He received permission to return to France in 1819, and lived in complete retirement till his death, which took place at Paris, 2d Feb., 1840. Napoleon had elevated him to the rank of a count of the empire. In 1799, he published an *Essay on the Causes which led to the Establishment of the Commonwealth in England in* 1649, a work which had an extraordinary circulation, and did much to prepare men's minds for the revolution of the 18th Brumaire. He prosecuted the same general subject in his political picture of the reigns of Charles II. and James II. (*Tableau Politique*, etc., 2 vols.,

Brussels, 1818). He wrote also Bourrienne and his errors, voluntary and involuntary (*Bourrienne et ses Erreurs*, etc., 2 vols., Par. 1830), a work not without value in reference to the history of Napoleon.

His son, HENRY BOULAY DE LA MEURTHE, was b. at Paris in 1797. He took an active part in the revolution of 1830, but became an opponent also of the government of Louis Philippe. He devoted great attention to questions of social economy, contributing much to promote the establishment of houses of refuge (*salles d'asile*), the extension of elementary education, and many improvements in the condition of the laboring classes. In the national assembly of 1848, he associated himself with the moderate republicans, and in Jan., 1849, was elected vice-president of the republic. Nevertheless, he tacitly acquiesced in the *coup d'état* of Dec., 1851, and became a member of the imperial senate. He d. at Paris, 24th Nov., 1858.

BOULDER, a co. in n. Colorado, e. of the Medicine Bow mountains; intersected by the Colorado Central railroad, and on the Denver and Boulder branch of the Kansas Pacific; 600 sq.m.; pop. '70, 1939; in '80, 9,746, watered by streams running into the South Platte; productions agricultural; besides gold, silver, and coal. Co. seat, Boulder, or Boulder City.

BOULDER, a city in Boulder co., Col., on the Colorado Central, and a branch of the Kansas Pacific railroads, near the e. foot of the Rocky mountains, 25 m. n.w. of Denver; pop. '80, 3176. There are gold and lignite mines near by. The city is the seat of the state university. There are three churches and two weekly papers.

BOULDER-CLAY, DILU'VIUM, DRIFT, or TILL, is a post-pliocene bed of a remarkable character, and as yet somewhat mysterious history. It usually occurs as the lowest or first of that group of beds which geologists recognize as the post-tertiary, post-pliocene, pleistocene, or superficial formation. The only exception is when a bed of sand intervenes—as is rarely the case—over the surface of the subjacent rocks. It consists of a compact clay, blue or red, according to the prevalent character of the subjacent rocks, having boulders diffused throughout its mass, and with here and there thin lenticular beds of gravel and sand interspersed. In some places in Scotland it is not less than 70 ft. thick. In America, it extends to about the 38th parallel; in Britain, it terminates a little to the n. of London. The boulders, which are the most striking feature of this bed, differ in size from a small pebble to masses many tons in weight. They are portions of rocks of all ages, more or less worn. The older rocks, when from a distance, are rounded, while those that have been broken from rocks in the district are more angular. These masses are scattered without order in the clay, the heaviest blocks occurring frequently in the upper portion of the bed. Nor is there any indication of their having sunk in the clay from gravity—the clay seems to have been so viscid when the materials assumed their present position, as to have successfully resisted the immense pressure of these enormous blocks. The boulders have not that rounded appearance produced by the action of water in a river-course or on the shore between high and low water marks. They have a greater or less number of *rubbed faces*, produced evidently by being forced, while held in one position, over the solid rocks beneath. The rubbed and scratched surfaces exhibited on these rocks, when the superincumbent clay is removed, plainly testify to their origin. Several interesting examples of such rubbed surfaces exist in the neighborhood of Edinburgh. They have been carefully examined and described by Fleming, Chambers, Milne-Home, and other local geologists. A careful observer can determine from the scratchings the direction of the current which bore with it the rubbing boulders. In the district to which we have alluded, these indicate a current from the west. The general direction, however, in America, in Britain, and in Scandinavia, seems to have been from the poles towards the warmer regions of the earth.

The B. contains no fossils strictly its own. Organisms exist in the boulders obtained from the older fossiliferous rocks; but no indications have hitherto been observed of a fauna or flora belonging to the period of the deposition of this bed. In the brick clays and gravels overlying it in Scotland, there are shells of arctic character.

The origin and structure of this remarkable bed have been a puzzle to geologists. That it was produced by the Noachian deluge, as was universally believed not many years ago, finds now no supporters. The present approved explanation assigns it as the product of a glacial ocean, in which the materials were borne violently along, pressing hard upon the sea-bottom, so as to wear and scratch it. But, while there is little room to doubt that such was the general fact, it remains to be shown how a merely ice-charged ocean could carry along such vast masses of clay and blocks allowing them all the time to press so hard upon the sea-bottom as to mold its whole figure—for such appears to have been its work.

BOULDERS, ERRATIC, are large masses of rock found at a distance from the formations to which they belong. The term is generally applied when they are found lying detached on the surface; in which case they may either have been washed out of the boulder-clay (q.v.), or have been carried separately by icebergs, and dropped in their present situations. Large blocks of Scandinavian rocks are scattered over the plains of Denmark, Prussia, and northern Germany. From their magnitude and number, they frequently form a striking feature in the landscape. They abound on the shores of the firth of Forth—a large one, locally known as the "Penny Bap," is the most promi-

rent object on the beach a little to the e. of Leith. The pedestal of the statue of Peter the great, in St. Petersburg, was hewn out of a large erratic boulder, 1500 tons in weight, that lay on a marshy plain near that city.

BOULEVARD, or BOULEVART (Ital. *Boluardo*), identical with Eng. *bulwark* (q.v.), the name given in France to the old fortifications, ramparts, etc., with which towns, or portions of them, were, or still are surrounded. In France and Germany, these ancient works have generally been leveled, the ditches filled up, and the space thus obtained employed for the formation of parks, promenades, and streets lined with trees. These, however, in France, still bear the name of boulevard. The boulevards of Paris are celebrated, and are of great service as open spaces promoting the circulation of air amidst the dense mass of habitations. Some parts of them present a very dazzling spectacle; and as a whole, they afford a striking exhibition of the life and character of the French capital in all the different classes of society. The *Boulevard des Italiens* is particularly known as the rendezvous of the fashionable, and the *Boulevard du Temple* as the place where the small theaters are to be found which are frequented by the common people and the inhabitants of the suburbs, for which reason the expression *Théâter de Boulevard* is often employed to denote a theater for the common people, or one of an inferior kind. The Thames Embankment is essentially a boulevard.

BOULLONGNE, LOUIS DE, 1654–1734; like his father and brother a French painter; member of the academy, rector thereof, and president; first painter to the king, and designer of medals and devices for the academy of inscriptions. The Gobelins tapestry for the king's apartments was made after his designs in imitation of Raphael. B. was also an excellent engraver.

BOULOGNE, a t. of France, in the department of the Seine, on the right bank of the river of that name, about 5 m. w. of Paris, from which it is separated by the Bois de Boulogne. A fine stone bridge of twelve arches crosses the Seine from B. to St. Cloud. Pop. in 1876, 21,556. The Bois de Boulogne is traversed by many walks, through the broadest of which the fashionable world of Paris travels in Easter-week to the abbey of Longchamp. At the entrance of the wood lies Auteuil (q.v.). During the revolution, the trees of the older walks were mostly cut down. But when Napoleon chose St. Cloud, in the immediate neighborhood, for his summer residence, new walks were planted and laid off, and the inclosing walls were restored. This wood, which from ancient times to the present day has been a place of enjoyment and recreation to the Parisians, was again much injured during the siege of 1870–71.

BOULOGNE-SUR-MER, a fortified seaport in the department of Pas-de-Calais, France, situated at the mouth of the Lianne, in the English channel, about 19 m. s.w. of Calais, and 139 n.n.w. of Paris. Lat. 50° 45′ n., long. 1° 36′ e. The town consists of two parts —upper and lower Boulogne. The upper town was, in former times, strongly fortified, but its citadel was demolished in 1690, and its ramparts have been converted into beautiful promenades, with fine views, and from which, in clear weather, the spire of Dover can be seen. The upper town contains the hôtel-de-Ville, and the cathedral, a modern edifice with a conspicuous dome. The lower town, which is more properly the seaport, is newer, finer, more populous, and more lively, inhabited chiefly by merchants, mariners, and fishermen. It contains the barracks, the great hospital, the theater, the museum, and gallery of art. The streets have been much improved by side-pavement, and many new and elegant buildings have been erected. A large wet-dock was completed in 1872. B. has numerous churches and educational institutions; is the seat of various associations; has extensive and excellent salt-water baths; and on account of its fine sands, is much resorted to for sea-bathing. Pop. in 1876, 40,075, actively engaged in the boiling of sugar, in the manufacture of linen and sail-cloth, cordage, etc., and in fishing, the coast being productive in oysters, herring, cod, and mackerel. B. has an active coasting trade, and ranks with Calais as one of the nearest and most frequented places of passage between France and England, steamers plying daily to London, which they reach in from 9 to 10 hours, and twice a day to Folkstone, which they reach in about 2 hours. B. is much resorted to by the English, who form a large section of the population, and for whose accommodation there are numerous hotels and boarding-houses. Paris is reached by railway from B. in 4¼ hours. The harbor of B. is too shallow for large ships of war, which can only reach the wide and safe roads of St. Jean; it was, however, considerably enlarged and improved by Napoleon I., and also more recently—so that at high water large merchant-vessels can, without danger, pass out or in. The long pier forms a fine promenade. B. was anciently called *Gesoriacum*, in the country of the Morini; after the time of Constantine the great, it was called *Bononia*, and after that of the Carlovingians, *Bolonia*. In 1435, B. came into the possession of the duke of Burgundy, and was united with the crown of France by Louis XI. in 1477. B. was besieged by Henry VII. of England in 1492, taken by Henry VIII. in 1544, and restored to the French by Edward VI. in 1550. From this point Napoleon contemplated the invasion of England; and here he encamped 180,000 men and collected 2400 transports, ready at any favorable moment to swoop down on the shores of Britain; but after months' watching, the war with Austria created other employment for them. As a memorial of this great camp, a tall marble column was commenced on the higher grounds; but being incomplete at the restoration of the Bourbons, it was finished and

inaugurated in honor of Louis XVIII. It has since been restored to its original object, and surmounted by a colossal statue of Napoleon. The poets Campbell and Churchill died at B.; and the house, or rather, the house occupying the site of that in which Le Sage, the author of *Gil Blas*, is said to have died, is shown to the visitor. Altogether, B. is to be described as a thriving and agreeable place of residence; and from its accessibility to English tourists, and rapid railway transit to Paris, it has greatly superseded Calais as a place of debarkation.

BOULTER, HUGH, 1671–1742; chaplain to the archbishop of Canterbury; rector of St. Olave's, archdeacon of Surrey; chaplain to George I.; tutor to Frederick, prince of Wales; bishop of Bristol, dean of Christ church (Oxford), archbishop of Armagh, and primate of Ireland, for 19 years chief justice of Ireland. He expended $150,000 in adding to the incomes of poor clergymen and their widows, establishing schools, etc. In the famine of 1740 he fed 2500 persons each day at his individual expense. B.'s *Letters to Several Ministers of State in England Relative to Transactions in Ireland from* 1724 *to* 1738 are a valuable contribution to history.

BOULTON, MATTHEW, a celebrated English mechanician, was b. in 1728 a Birmingham, where his father, who had a steel manufactory, had acquired a considerable fortune. When still very young, he undertook, at his father's death, the business of the manufactory, which he carried on with great energy, and extended, in 1762, by the purchase of a piece of land, then a barren heath, at Soho, near his native town. One of his first inventions was a new mode of inlaying steel. He entered into partnership with James Watt (q.v.), who had obtained a patent for the great improvements in the steam-engine which have immortalized his name, and they established a manufactory of steam-engines in 1769. They jointly contributed also to the improvement of coining machinery, and so to the perfection of the coinage itself. B. died at Soho, 17th Aug., 1809. His long life was devoted to the promotion of the useful arts and of the commercial interests of his native country. He was a man of extremely pleasing conversation, and of a most generous disposition.

BOU MAZA (SI MOHAMMED BEN ABDALLAH), b. 1820; an Algerian Arab leader, who as a dervish in 1845 excited the people of Dahra against the French, and, in alliance with Abd-el-Kader, engaged in several conflicts. St. Arnaud made him a prisoner and sent him to Paris, where he received a pension and was provided with a home. He escaped, Feb. 23, 1848, but was caught and sent as a prisoner to Ham, where he was kept a year and a half. In the eastern war of 1854, he commanded an irregular corps, and the next year was made a col. in the French army.

BOUND, or BOUNDARY, the utmost limits of land by which the same is known and can be described; being in this sense synonymous with *abuttals*, which means the buttings and boundings of lands, e., w., n., and s., with respect to the places by which they are limited and bounded. The *sides* of the land are properly said to be *adjoining*, and the ends *abutting*, to the thing contiguous. For other applications of this term, see the articles that follow.

BOUNDARIES OF BOROUGHS, CITIES, AND TOWNS in England are settled by the 5 and 6 Will. IV. c. 76, ss. 7 and 8, which refers to and adopts, for the purpose of such boundary, the regulations of the 2 and 3 Will. IV. c. 64—amended, however, by the 5 and 6 Will. IV. c. 103. These boundaries are generally the same as the parliamentary limits. The corresponding Scotch law on this subject is contained in the 3 and 4 Will. IV. c. 76, which adopts the limits prescribed in the 2 and 3 Will. IV. c. 65.

By the 7 Geo. IV. c. 64, it is enacted that where, in England, any felony or misdemeanor shall be committed on the boundary or boundaries of two or more counties, or within the distance of 500 yards of any such boundary or boundaries, or shall be begun in one county and completed in another—every such felony and misdemeanor shall be dealt with and tried in any of the counties.

BOUNDARIES OF PARISHES are determined by ancient and immemorial usage, as to which, see PARISH, and see BEATING THE BOUNDS. It may also be observed that by numerous acts of parliament lately passed, for extending church accommodation, and making more effectual provision for the cure of souls, it is generally provided that any part or parts of any parish may be constituted a separate district for spiritual purposes, or parish *quoad sacra*, as it is called in Scotland; and that any parish may also be divided into two or more distinct and separate parishes for all ecclesiastical purposes, though for other purposes the old limits remain. The church building and inclosure acts contain many provisions as to boundaries.

BOUNDARY SURVEY OF IRELAND. This important subject is provided for and regulated by these acts of parliament—the 6 Geo. IV. c. 99, 17 Vict. c. 17, 20 and 21 Vict. c. 45, and the 22 and 23 Vict. c. 8, which are all to be read as one act. The boundary surveyor may alter the names of lands erroneously named in the ordnance map of any county, on the application of the owners of such land, who are to state the ground on which such application is made. And the same surveyor may define the boundaries of parishes divided under certain acts of parliament. The publication in the *Dublin Gazette* of the surveyor's report, referred to in the order of the lord-lieutenant in council, is to be discontinued, on the ground of its being unnecessary and expensive;

and in lieu thereof, any person desirous of seeing the report and ordnance plans, may see them at the council office, in Dublin, at all reasonable hours, without fee or reward. See ORDNANCE SURVEY and SURVEY; and see IRELAND.

BOUND-BAILIFF, in England, is an officer of the sheriff whose duty is to discover and arrest debtors. As the sheriff is responsible for the misconduct of these bailiffs, they are annually bound in an obligation, with sureties, for the due execution of their office, and are, in consequence, called *bound*-bailiffs, a name which Blackstone is at pains to inform us "the common people have corrupted into a much more homely appellation" —*bum-bailiff*. See BAILIFF.

BOUNDING CHARTER, in the Scotch law, is an instrument of title which describes the lands thereby conveyed by their boundaries or limits. It gives right to everything within the bounds, and, on the other hand, it excludes what lies beyond these. If the boundary be the sea or the sea-shore, the right is extended or limited as the sea recedes or advances. If, again, it be a stream or river, the property may be subject to alteration, either extended by *alluvion* (q.v.), or by the gradual and imperceptible variation of the channel; or the stream may cease to be the boundary, in consequence of some violent change. But if the property described in the charter is bounded by walls, the walls, as a general rule, will not be held as included in the grant; and where it is intended that a wall is to be mutual, this must be expressed. When the grant is described both by boundaries and by measurement, the boundaries determine its extent, although containing a larger quantity of ground than the measurement. The lands, however, may be described simply by reference to a plan, and this is a conveyance which makes a valid bounding charter. By statute also a reference to a leading name in a prior deed is a sufficient description. The following articles should be consulted in connection with this subject—CHARTER; CONVEYANCE; TITLE; and GRANT.

BOUNTY is a sum of money given to encourage men to enter the army or navy. In time of peace, when there is little or no need to augment the forces, the B. sinks to a minimum; but in cases of exigency, it is raised according to the difficulty and urgency of the circumstances. In the British army, no B. was paid to recruits until about half a century ago; the temptations offered to them, if any, were of some other character. The highest B. ever paid during the great wars against Napoleon was in 1812, when it amounted to £18, 12*s.* 6*d.* for limited service, and £23, 17*s.* 6*d.* for life; but these sums were in great part nominal, being subject to many unfair and absurd deductions. Even so late as 1849, when the B. to an infantry recruit was nominally £4, he received little more than one eighth of this amount, all the rest being swallowed up in fees and drawbacks of various kinds. The only B. which now exists is a free kit—no other being allowed. The young men who used to enter the British army were supposed, for the most part, to have been tempted by immediate B. rather than by prospective pays and pensions; and thus it arose that the rate of B. varied frequently, while those of pay and pensions underwent very little change. In 1855, it was £7 per head (for line infantry); in 1856, only £2; in 1858, £3; and it afterwards underwent further changes. It was always higher to the cavalry and artillery than to the infantry; and in the latter it was higher to the Highland than to the other regiments, on account of matters connected with dress and personal ornaments. The relation which the B. bore to the other emoluments of the soldier are explained under ENLISTMENT, RECRUITING. In reference to seamen, the subject will receive elucidation under MANNING THE NAVY.—The term B. is also used in the navy to signify the payment and distribution of money to which the officers and crew of her majesty's ships and vessels of war may, on particular occasions of active service, be entitled. See PRIZE, SALVAGE, BOOTY.

BOUNTY, a term applied to any sum granted by the legislature towards creating or encouraging some kind of undertaking believed to be of national importance. At one time there was no end to the giving of bounties in this way from the public purse—there were bounties on exporting corn, with a view to encouraging agriculture; there were bounties on the tonnage of vessels employed in the herring and whale fisheries; on the importation of materials of manufactures; on the importation of indigo from the colonies; on the exportation of Irish linen, etc. The fallacy of this costly and factitious process for fostering commerce, manufactures, and agriculture was amply demonstrated by Adam Smith in his *Wealth of Nations;* one of his more striking facts being, that every barrel of herrings which sold for 20*s.*, cost the government about 25*s.* The notion that bounties may properly be given as an encouragement in the infancy of undertakings, has been happily exploded. It is ascertained that, besides taxing the general community in order to reward or encourage individuals, bounties do no real good to the parties so favored; for by such inducements they engage in business for which they have no special vocation, or which, in existing circumstances, it would be preferable to let alone. Misdirection of capital, talent, and industry are, in short, the inevitable result of bounties, as of all measures alleged to be for the special protection of trade. The subsidies in the form of extra rates paid to certain steamboat companies for carrying the mails may be said to be the last remnant of British bounties. The carrying of the mails, as involving greater responsibilities than ordinary goods, is paid at much higher rates, even where the ordinary traffic is remunerative, as on the Atlantic route, which

is crossed by the greatest number of steamboat lines. Here the post-office, after a trial of open competition for the conveyance of the mails, in 1878 returned to the system of special contracts with certain of the most reliable companies at increased rates. These contracts have been objected to in the house of commons as monopolies.

BOUNTY OF QUEEN ANNE. See QUEEN ANNE'S BOUNTY.

BOUQUET OF WINE is the peculiar flavor yielded by the better class of wines, and which is due principally to the presence of œnanthic ether. See WINE.

BOUQUETIN, or IBEX of the Alps (*capra ibex*), a species of goat which inhabits the highest regions of the Alps, even higher and wilder than those inhabited by the chamois, up to the limits of perpetual snow. It is the *ibex* of the ancients. See IBEX. In German Switzerland, its name is *steinbock*. It was at one time found on all the higher Alps, but has disappeared from most of them, and exists chiefly on those between the Valais and Piedmont, where it is carefully protected by the Sardinian government. It is larger and more powerful than the common goat, and has a small head and great horns (those of the male 1½ to 2 ft. long), which curve backwards, are directed a little outwards, and have prominent transverse knots or bands on the front. The horns of the females are only about 6 in. long. The hoofs are large, rough on the sole, and capable of being spread widely apart, to give greater security of footing. The general color is brown. The body is covered with two kinds of hair, the longer hair being mixed, at least in winter, with thick soft wool. There is no beard, except a few hairs in winter, although the animal has been often incorrectly figured as having one.

The B. feeds on the herbage and small shrubs which are found on the last confines of vegetation, and descends by night to browse in the highest forests, the lichens and branches of which supply much of its winter food. It is capable of enduring great cold, and will remain, with seeming indifference, for hours on the summit of a rock, motionless, during the most severe storm. It possesses an extraordinary power of bounding from crag to crag, and of ascending or descending almost perpendicular precipices. Even the projections of a wall of rough masonry have been seen to suffice for the feet of a tame one to take hold of. One has also been known frequently to spring from the ground, without a race, and plant itself on a man's head. Tschudi rejects as a fable the statement which has been repeated by one naturalist after another, from the days of Gesner, that the B. throws itself down precipices, so as to fall upon its horns, their elasticity preserving it from injury.

Bouquetin.

When taken young, the B. is easily tamed. It readily associates with common goats, and breeds with them, and the hybrids produce young, of which, however, it does not appear that in any case both parents have been ascertained to be hybrids.

Whether this animal might not be made useful to the inhabitants of such countries as Iceland and Greenland, no one seems to have thought of trying.

BOURBAKI, CHARLES DENIS SAUTER, of Greek descent, b. Paris, 1816; a sub-lieut. of zouaves in 1836, and in 1838 lieut. in the first regiment of the foreign legion. In 1842, he was capt. of zouaves; in 1846, maj. of the native skirmishers, and rapidly rose to be gen. of division. He won great distinction at the Alma, at Inkermann, and in the assault on Sebastopol. He also participated in the Italian expedition in 1859. In 1869 he was commander of the second camp at Chalons, and aid-de-camp to the emperor. In the war with Germany he had an important part in the conflict around Metz, and in the unsuccessful attempt to break through the German lines. In Dec., 1870, he was made chief of the badly demoralized army of the north, which he reorganized; and with it he fought several severe battles. He was at last compelled to retreat toward Switzerland, and in Jan., 1871, he was driven over the Swiss frontier with the remnant of his army. B. was so much discouraged by his many disasters that he attempted suicide, but the wound (a pistol shot in the head) was not fatal. It was said that this act was because Gambetta charged him with treason. After peace he returned to France and received a military command at Lyons.

BOURBON, a co. in s.e. Kansas on the Missouri border and the Little Osage and Marmiton rivers, 576 sq.m.; pop. '70, 15,076; '80, 19,541. The railroads are the Missouri river, Fort Scott and Gulf, and the Missouri, Kansas, and Texas. Agriculture is the chief occupation. Co. seat, fort Scott (100 m. from Kansas city), with a pop. of about 4500.

BOURBON, a co. in n.e. Kentucky, on the South Licking river; 400 sq.m.; pop. '70, 14,863—6677 colored. It is a fine agricultural region, and has among its attractions sulphur and chalybeate springs, and a curious ancient earthwork. The celebrated Bourbon whisky takes its name from this county. The Kentucky Central and the Paris and Mayville railroads traverse the county. Co. seat, Paris.

BOURBON, a French family of the highest note in history, and which came to possess several European thrones, derives its name from the castle and seignory of Bourbon, in the former province of Bourbonnais, in the center of France. The first lord *or sire* of this family, of whom history makes mention, was Adhémar, at the beginning of the 10th century. The fourth in succession from him, Archambauld I., added the name of the family castle to his own. Under his successors, who also bore the name of Archambauld, the family possessions were soon very much increased. At length the seignory of Bourbon having devolved upon an heiress, who, in 1272, married Robert, the sixth son of Louis IX. of France, thus passed to a branch of the royal family of the Capets, under whom it was converted into a duchy. The principal branch of this family was, in 1523, deprived of all its dignities and possessions, because the duke, Charles de B. (q.v.), the famous constable, allied himself with Charles V. against Francis I. of France.

Of the collateral branches, that of Vendôme acquired great importance, first attaining by marriage, in the person of Antoine de B., duke of Vendôme, to the throne of Navarre; afterwards by inheritance to the throne of France, in the person of Henry IV., on the extinction of the male line of the house of Valois; and by the fortune of war to the thrones of Spain and Naples. Among the numerous other collateral branches may be mentioned those of Montpensier, De la Marche, Condé, Conti, Soissons, and Orleans. Only a few members of the collateral lines, however, have borne the name of B.; for example, the cardinal Charles de B., duke of Vendôme, who, under the name of Charles X., was set up by the Catholic league as a rival king to Henry IV. The ducal dignity was revived by Louis XIV. in the house of Condé, so that the eldest son of that house should bear the title of duke of Bourbon.

The dynasty of the Bourbons in France begins with Henry IV. (q.v.), who, after the assassination of Henry III., became, in virtue of the Salic law (q.v.), the next heir to the French throne. Through his father, Antoine de B., king of Navarre and duke of Vendôme, he was descended from Robert, son of Louis IX., and husband of Beatrix, heiress of Bourbon. On his assassination in 1610, he left, by his second wife, Mary de' Medici, five legitimate children: 1. Louis XIII. (q.v.), his successor on the throne; 2. J. B. Gaston, duke of Orleans (q.v.), who died in 1660, and left no male heirs; 3. Elizabeth, married to Philip IV. of Spain; 4. Christina, married to Victor Amadeus, afterwards duke of Savoy; 5. Henrietta, married to Charles I. of England.—Louis XIII., on his death in 1643, left two sons by his queen, Anne of Austria: 1. Louis XIV. (q.v.), his successor; and 2. Philip, who received from his elder brother the title of duke of Orleans, and was the founder of the family which has become the younger B. dynasty.—The dauphin Louis, styled monsieur, the son of Louis XIV. by his marriage with Maria Therese of Austria, died on 14th April, 1711, and left three sons by his marriage with Maria Anna of Bavaria: 1. Louis, duke of Burgundy (q.v.); 2. Philip, duke of Anjou, who afterwards became king of Spain, as Philip V.; 3. Charles, duke of Berri, who died in 1714.—Louis, duke of Burgundy, died in 1712. By his wife, Maria Adelaide of Savoy, he had three sons, of whom two died in early youth, the only one who survived being Louis XV., who succeeded his great-grandfather, Louis XIV. in 1715.—Louis XV. having married Maria Leszcynska, daughter of the dethroned king Stanislaus of Poland, had by her a son, the dauphin Louis, who married Maria Josepha of Saxony, and died in 1765, leaving three sons: 1. Louis XVI. (q.v.), who succeeded his grandfather, Louis XV., in 1774; 2. Louis Stanislaus Xavier, count of Provence, afterwards Louis XVIII.; 3. Charles Philippe, count of Artois, afterwards Charles X.—Louis XVI. had three children by his queen, Marie Antoinette of Austria: 1. The dauphin Louis, who died in 1789; 2. Louis, called Louis XVII. (q.v.), who died in 1795; 3. Marie Therese Charlotte, styled Madame Royale, afterwards duchesse d'Angoulême (q.v.).—Louis XVIII. had no children; but Charles X. had two sons: 1. Louis Antoine de B., duke of Angoulême (q.v.), who was dauphin prior to the revolution of 1830, and died without issue in 1844; 2. Charles Ferdinand, duke of Berri (q.v.), who was murdered in 1820. The duke of Berri left two children: 1. Marie Louise Therese, styled Mademoiselle d'Artois, married to the duke of Parma; 2. Henry Charles Ferdinand Marie Dieudonné, duke of Bordeaux, now styled count de Chambord, the representative of the elder branch of the Bourbons, till June, 1871, exiled from France, and whom the French legitimists sometimes designate Henry V.

It has already been stated that the founder of the Orleans or younger branch of the B. royal family of France, was Philip, duke of Orleans (q.v.), the younger brother of Louis XIV. He d. in 1701, leaving, by his second marriage with Elizabeth Charlotte of the Palatinate, a son of his own name as his heir, who was regent of France during the minority of Louis XV. His son, Louis Philippe, duke of Orleans (b. 1703), married a princess of Baden, and died in 1752, leaving an only son of his own name (b. 1725, d. 1785), whose son and heir was that Louis Joseph Philippe, duke of Orleans (q.v.), so

notable in the French revolution, who in 1792 renounced his rank, taking the name of Citizen Egalité, and died by the guillotine in 1793. He left four children: 1. Louis Philippe (q.v.), who, before the revolution, was styled duke of Chartres—that being the ordinary title of the eldest son of the Orleans family—became afterwards duke of Orleans, was king of the French from 1830 to 1848, and d. in England on the 26th of Aug., 1850; 2. the duke de Montpensier, who died in England in 1807; 3. the count de Beaujolais, who died at Malta in 1808; 4. Adelaide, styled Mademoiselle d'Orleans, b. 1777, d. 1847.—Louis Philippe left a numerous family by his queen, Amelia of Naples; but his eldest son, Ferdinand, duke of Orleans, lost his life by an accident on the 13th of July, 1842, leaving by his wife, the princess Helen of Mecklenburg-Schwerin, two sons, the eldest of whom, Louis Philippe Albert, now styled count of Paris, is the representative of the younger or Orleans B. family.—Concerning the other members of Louis Philippe's family, see the article LOUIS PHILIPPE.

Louis XIV. having succeeded in placing his grandson, Philip, duke of Anjou, on the throne of Spain, in 1700, as Philip V., this prince became the founder of the Spanish B. dynasty, as well as of the B. dynasties of Naples, Parma, and Piacenza. These dynasties endured only a temporary overthrow from the policy and arms of Napoleon Bonaparte. Philip V. was succeeded on the Spanish throne by his son, Ferdinand VI., who died without issue in 1759, and the crown fell to his brother, Charles III., whose son and successor, Charles IV., was compelled to resign it in 1808, in favor of a successor nominated by Napoleon, and died at Rome in 1811. The two eldest sons of Charles IV. by his marriage with Maria Louisa of Parma were—1. Don Fernando, prince of Asturias, who, after the overthrow of Napoleon, ascended the Spanish throne as Ferdinand VII. (q.v.), and whose eldest daughter reigned till 1868; 2. Don Carlos (q.v.), who, on the death of his elder brother in 1833, became pretender to the Spanish throne until 1845, when he resigned his pretensions in favor of his son, count de Montemolin. He died at Trieste, 1855. The count de Montemolin died in 1861, and his claims to the Spanish throne are now represented by his nephew, Don Carlos, son of his brother Juan.

Philip V. did not succeed in keeping possession of the crown of the Two Sicilies (see NAPLES) as of that of Spain; the house of Hapsburg being restored there in the person of a son of Leopold I., who in 1720 ascended the throne as Charles III. But in consequence of the peace of Vienna, the son of Philip V. became king of the Two Sicilies, likewise by the name of Charles III. Upon his accession to the throne of Spain in 1759, he gave up that of Sicily to his third son, Don Fernando, called Ferdinand IV., with the express stipulation that it should never again be occupied by a king of Spain. Ferdinand IV. was compelled to yield to the French arms in 1806; but after the overthrow of Napoleon, he became king of the Two Sicilies as Ferdinand I. (q.v.). His son, Francis I., left the throne in 1830 to his son Ferdinand II. (q.v.), whose son, Francis II., was expelled in 1860, when Naples was incorporated with the new kingdom of Italy.

By the peace of Aix-la-Chapelle in 1748, Austria made over the duchies of Parma and Piacenza to Don Philip, the youngest son of Philip V. of Spain, but with stipulation of their reversion to Austria on the failure of his male descendants, or on his succeeding to the throne of Spain. He was succeeded in 1765 by his son, Ferdinand I., whose son, the hereditary prince Charles Louis Ferdinand, was made king of Etruria in 1801, under the guardianship of his mother, Maria Louisa of Spain; but Etruria being soon incorporated with France, they were completely dispossessed. The congress of Vienna assigned Parma and Piacenza for life to Maria Louisa of Austria, the spouse of Napoleon, but meanwhile indemnified Maria Louisa of Spain with the duchy of Lucca. In 1847, Parma and Piacenza reverted to the B. family, in the person of the former king of Etruria, Charles Louis de B., who had succeeded his mother in Lucca in 1824. He abdicated on Mar. 14, 1849, and was succeeded as duke of Parma and Piacenza by his son, Charles III., and he in 1854 by his son Robert—born 1848—whose mother, Maria Louisa Theresa de B., daughter of the duke of Berri, then became regent of the duchies. The B. family lost these duchies in 1859. See ITALY and PARMA; and see Coiffier-Demoret, *Histoire du Bourbonnais* (1828); Achaintre, *Histoire Chronologique et Généalogique de la Maison Royale de Bourbon* (1825); also histories by Mure (Par. 1860–68) and Dussieux (1869).

BOURBON, CHARLES, Duke du BOURBONNAIS, styled CONSTABLE DE BOURBON, b. 1489, was the son of the count of Montpensier; and in consequence of the death of his elder brother, and his marriage with the only daughter of the duke of Bourbon, he united in his own possession the vast estates of both these branches of the Bourbon family. Holding a very high position in virtue of his birth and wealth, he soon showed himself to be no ordinary character, by the brilliancy of his exploits in arms, and by his rigid morals and severe taciturn disposition. At the age of 26, he received from Francis I. the constable's sword, and was sent to Italy at the head of an army, which he disciplined on the march: and crossing the Alps by passes previously deemed impracticable, he surprised the hostile generals, won the battle of Marignan, 1515, and within a few days placed the keys of the citadel of Milan in the king's hand, acquiring for himself by these exploits the reputation of the greatest general of his time. But Maria Louisa, the king's mother, became enamored of the brave constable; and he, although a widower,

declined her hand, openly declaring that he deemed her a woman devoid of modesty and not to be thought of for a wife. Her revenge led to the seizure, on behalf of the crown, of the estates which he had acquired through his wife, and the withholding of his pay as constable. Thus deeply injured, he renounced the interest of France, and concluded a private alliance with the emperor Charles V., and with Henry VIII. of England. The former agreed to give him in marriage his sister, Eleonora, who had Portugal as her jointure, and to make an independent kingdom for him of Provence and Dauphiné, with his own possessions of the Bourbonnais and Auvergne. The rest of France was to be apportioned between the two confederates. The king, who was engaged in an expedition to Italy, received intelligence of this conspiracy. Forthwith he proceeded in person to the constable, and offered him restoration to favor and also of his estates. The constable, however, did not trust him, but fled in disguise, and reached Franche Comté in 1523. In order not to appear as a fugitive to the Spanish army, which awaited him in Lombard, he drew around him 6000 German lancers, and soon contrived to gain their entire attachment. He attacked, in 1524, the French army on its march over the Alps, and thought to have advanced to the heart of France with the Spaniards, whose general he had been appointed by the emperor. But Charles V. did not entirely trust him, and appointed the marquis of Pescara to assist and watch him. He was compelled to relinquish the siege of Marseilles, on the approach of Francis I. with a great army. He repassed the Alps, and took his revenge in the battle of Pavia, 24th Feb., 1525, where the king was made a prisoner. He now went to Madrid, but soon found himself entirely disappointed in his hopes, and was sent back to Lombardy by Charles V. Without money or support, surrounded by daring and mutinous bands, he conceived a plan to found for himself an independent dominion of his own, and to unite himself with France against Spain. Hastily gathering together the wild bands around Milan, he led them against Rome; and on 6th May, 1527, unprovided with things necessary for a siege, appeared before the walls of that city. Resolved to conquer or die, he led up his troops in the most impetuous manner, and eagerly seized with his own hands a scaling-ladder, in order to make his way over a weak place of the walls, when he was mortally wounded by a bullet, which Benvenuto Cellini afterwards asserted that he had shot. His death was kept secret for a time from the storming army under his command. When it departed from Rome two months after, his corpse, which the soldiers would not part with, was taken with them, and buried at Gaeta, under a magnificent monument, which, however, was afterwards destroyed.

BOURBON, ILE DE, or, as it is called at present, **REUNION**, an island in the Indian ocean, the southernmost of the Nascarene isles, laying about 100 m. s.w. from Mauritius, and 360 m. e. from Madagascar. It is one of the most important of the insular colonies of France. It has an area of about 950 sq.m., being about 38 m. in length, and 28 in its greatest breadth. Pop. '73, 193,362, including some hundreds of Chinese, 6000 negroes, 34,500 Indians, and a garrison, and other officials, to the number of about 2000. It may be described as one great mountain mass, of which the highest peaks are the Piton de Neiges—in the center of the island, rising more than 10,000 ft. above the sea—the Grand Bernard, and the Cimandef, in the n., with respective heights of 9500 and 7500 ft.; and in the s.e., the Piton de Fournaise, 7200 ft. high, one of the greatest volcanoes in the world, and one of the most active, its eruptions taking place at least twice every year, and its lava-streams sometimes reaching to the sea. This volcano occupies perhaps one sixth of the island, often changes its crater, and is surrounded by a district of more than 10,000 acres, which is a dreary desert, and is called the *Pays Brûle* (Burned Land). Except in this part, however, the soil is in general extremely fruitful. About a fourth part of the island is cultivated, chiefly along the coast, although much of the interior is of great natural fertility. The scenery is very beautiful. Streams, although not large, are very numerous, and rush in cascades to the sea. The climate, which was once mild and salubrious, is now very unhealthy to Europeans, who cannot reside four or five years on the island without an attack of typhoid fever or dysentery. The s.e. monsoon and hurricanes often make fearful devastation. The plants of Arabia, of the Asiatic archipelago, and of the s. of Europe, succeed equally well here; coffee and cloves are produced, along with the fruits of Italy and Spain. The trade is estimated at about two millions sterling. By far the most important article of export is sugar; coffee, vanilla, cloves, saltpeter, wood for cabinet-making, and dye-woods are the other exports. The value of the exports, which up to 1867 had been steadily increasing, has since then greatly declined, as the crops have repeatedly suffered from cyclones, persistent drought, and blight. The cereals grown in the island are not sufficient for its own wants. Cattle are imported from Madagascar. The capital of the island, and seat of government, is St. Denis, on the n.w. coast, with 9000 inhabitants, a college, a botanic garden, etc. Lat. 20° 52′ s., long. 55° 30′ east. The mean temperature here is 77° F. There is an almost total want of harbors, the whole coast of the island possessing only two tolerable anchoring-places—one at St. Denis, and another at St. Paul, 18 m. further south. The coast is consequently very dangerous. In one year, 1843–44, no less than 11 large vessels were wrecked. B. and Mauritius were discovered by the Portuguese navigator, Mascarenhas, and named afrer him, the Mascarene isles. After the French had begun their attempt to found a colony in Madagascar, they took possession of B. in 1649, giving it that

name, which was changed to Réunion at the revolution, and to Isle Bonaparte in 1809. The name has been varied according to the political changes in France. The French having, in 1720, taken possession of Mauritius, which they named Isle of France, the Mascarene isles were placed under one governor. In 1810, they were taken by the British, but B. was restored to France in 1814.

BOURBON DE L'OISE, FRANÇOIS LOUIS, a notorious character of the French revolution, was b. in the middle of last c. at St. Remy, near Compiègne, and became a procurator in the parliament of Paris. He helped to storm the Tuileries on 10th Aug., 1792. He shortly afterwards obtained a seat in the convention by a trick, presenting himself as the regularly elected deputy for the department of Oise, in which he had actually been defeated by a namesake who was elected also for that of Loiret. The trick was subsequently discovered, but he was not ejected. B. contributed much to bring about the execution of Louis XVI., the insurrection of the 31st May, and the destruction of the Girondists. He was sent to La Vendée, where, however, he loudly condemned the revolutionary cruelties, and appeared in the character of a moderate. Obnoxious on this account to Robespierre and Hébert, and fearing for his head, he urged on with the greatest eagerness the overthrow of the Terrorists on the 9th Thermidor (27th July, 1794). From this time forth, B. showed himself an enemy of the clubs, and a protector of the nobles and the priests. In consequence of the insurrection of 13th Vendémiaire (5th Oct., 1795), he was sent as a commissioner to Chartres, where he behaved harshly and brutally. He passed from the convention into the council of five hundred, became a persecutor of the republicans, and joined a royalist club. The Directory placed him upon the prescription list after the 18th Fructidor (4th Sept., 1797). He was transported to Cayenne, where, in a short time, he died in great misery, tortured with remorse.

BOURBON-LANCY, a French watering-place on Saone-et-Loire, 20 m. n.w. of Charolles; pop. about 4000. Its mineral waters, which were known to the Romans, are useful in rheumatic and nervous affections. There is a hospital here, established by the Marquis d'Aligre.

BOURBONNAIS, a gently undulating, terrace-formed district in the center of France, northward of the high lands of Auvergne, abounding in grain, fruits, wine, iron, marble, and mineral springs. From 1327 to 1523, it formed the duchy of Bourbon, and afterwards, becoming a domain of the crown, it formed a separate province of France. It now constitutes the department of Allier, and part of the department of Cher. The capital was Moulins.

BOURBONNE-LES-BAINS, a t. of France, in the department of Haute-Marne, about 20 m. e.n.e. of Langres. It is pleasantly situated at the confluence of the Borne and the Aspace, and has some fine promenades and manufactures of cotton hosiery and cutlery. Its chief feature, however, is its saline springs, which range in temperature from 121° to 136° F., and are much resorted to by people suffering from chronic complaints or old wounds. Pop. '76, 3705.

BOURBON-VENDÉE. See NAPOLEON-VENDÉE.

BOURDALOUE, LOUIS, one of the greatest pulpit orators of France, was b. at Bourges, 20th Aug., 1632, and having, at the age of 16, entered into the order of Jesuits, obtained in succession the chairs of humanity, rhetoric, philosophy, and theological ethics in the academy of his native place. He showed a great capacity for science, but his remarkable powers of eloquence led his superiors finally to determine upon employing him as a preacher. Disdaining the inflated style prevalent among the tasteless pulpit orators of his time, he assailed with manly vigor and truly religious earnestness the passions, weaknesses, and errors of men. The dignity of his manner and the fire of his eloquence made him famous even when the public mind was occupied with the festivities of Versailles, the victories of Turenne, and the literary master-pieces of Corneille and Racine. At the court of Louis XIV. he was remarkably well received. After the revocation of the Edict of Nantes, he was sent to Montpellier, in 1866, to labor among the Protestants on behalf of the Roman Catholic church. B. particularly understood how to accommodate his eloquence to the minds of those whom he addressed. Simple among the simple, a dialectician among ecclesiastics, he was equally a favorite with the common people and with the learned and the great. He was also much esteemed and beloved as a man; and in all circumstances, maintained unimpeached a high reputation for candor and honesty. In the later years of his life, he relinquished the pulpit, and devoted his time to hospitals, prisons, and pious institutions. He died at Paris 13th May, 1704. How thoroughly his religious sentiments were governed by the theological tenets of his church, may be perceived from these remarkable words which he uttered on his deathbed: "It is highly reasonable that God be fully satisfied; and at least in purgatory I will suffer with patience and with love." Several editions have appeared of the collected works of B. (as 16 vols., Versailles, 1812, and most recently in the *Panthéon Littéraire*, 8 vols., Par. 1838). The best edition of his sermons is that published under the care of Bretonneau (16 vols. and 18 vols., Par. 1707–34). His life was written by Madame de Pringy.

BOURCHIER, JOHN, Lord Berners, 1474–1532; a descendant of Thomas of Woodstock, duke of Gloucester. B. was educated at Oxford, and was first known by quelling an insurrection in Cornwall. Henry VIII. made him chancellor of the exchequer for life, and he had charge of the king's sister Mary when she went to France to wed Louis XII. At Henry's command he translated Froissart's *Chronicles*, and he also translated the famous *Romance of King Arthur*, *The Exploits of Hugh of Bordeaux*, the *Golden Book* of Marcus Aurelius, and *The Castle of Love*. He also composed a comedy, *Ite in Vineam*, which it was customary to act at Calais after vespers.

BOURDEILLES. See BRANTÔME, *ante*.

BOURDON (in music), a drone bass produced by a bagpipe or hurdy-gurdy; also an organ stop, consisting of stopped wooden pipes, usually of 16 ft. tone. It is found on manuals as a "double" stop, and as a soft foundation stop on the pedal organ.

BOURDON, LOUIS PIERRE MARIE, 1799–1854; a French mathematician, professor in several colleges in Paris, inspector of studies, and a member of the council of the university. His *Elements* of arithmetic and algebra were widely used, the algebra, adopted by prof. Davies of West Point, becoming well known in this country.

BOURG, ANNE DU, 1521–59; a French Protestant martyr. He took orders in the Roman Catholic church, but because he became a Calvinist he left the pulpit for the bar, and was imprisoned as a heretic by Henry II. When Francis II. became king, B. asked for release, but about that time one of the judges who had presided at his trial was assassinated, and B. was hanged and his body was burnt.

BOURGELAT, CLAUDE, founder of the first veterinary school, and consequently the first to institute a distinct profession of veterinary surgeons. Born in Lyons in 1712, he died there in 1799. He was a learned lawyer, an able writer, and the bosom-friend of the great D'Alembert, enjoying also the esteem of Pembroke, Voltaire, Buffon, and Haller. He was instigated to further the cause of veterinary science from a natural liking for horses, and conceived the idea of educating men to alleviate their infirmities and those of other domestic animals. In the execution of this project he found a friend and collaborator in a minister of Lyons, Bertin; and in 1761, the first veterinary school was opened in the suburbs of the city. It was patronized by royalty, and students flocked to it from all parts of France, Italy, Switzerland, Germany, Sweden, and Denmark. Probably the only dark spot in B.'s veterinary career is his treatment of Vial de St. Bel, who, persecuted by his colleagues in France, came to England, and founded the St. Pancras college, Camden Town, London, in 1792. B. had, however, endowed the Lyons school with so much vital energy that it has maintained itself in the foremost ranks. From it all other colleges in Europe sprang, and with them it has kept pace, being superior to the majority, and rivaling the very best, even those of Paris and Berlin.

B. wrote much—his works on farriery, materia medica, external form, contagious diseases, and on the various apparatus and bandages used for quadrupeds, being still highly esteemed.

BOURG-EN-BRESSE, a t. of France, capital of the department of Ain, pleasantly situated on the left bank of the Reyssousse, about 20 m. e.s.e. of Macon. It is well built, has several public fountains, a statue to Bichat, the celebrated anatomist, who was a student at the hospital here, a museum, a fine corn-market, and a public library of 19,000 volumes. The distinguished astronomer, Lalande, was a native of B. It has manufactures of linen, cotton, hosiery, and leather, and a trade in agricultural produce. The town was captured by the allies in 1814. Pop. '76, 14,289.

BOURGEOIS, a type used in book and newspaper printing. When "solid" nine lines fill an inch and a slight fraction over. It is smaller than long primer and larger than brevier. One thousand *ems* of bourgeois occupy 13.86 square inches.

BOURGEOISIE, a French term, but now not unfrequently employed in English, German, and other languages. It denotes the citizens of towns as a rank or class of society, including persons from the condition of heads of manufacturing or mercantile establishments, down to master-tradesmen. The French B. have long been extremely hostile to the aristocracy, but have themselves latterly become the object of attack on the part of the operatives and of the extreme radical or red republican party. The term *bourgeois*, from which B. is formed, is quite distinct in meaning from *citoyen*, the latter term designating a citizen of the state.

BOURGES, the capital of the department of Cher, in France, situated in a fertile plain at the confluence of the Auron and the Eure, 123 m. s. of Paris. B. is divided into an old and new town, the latter being built round the former. Its houses are of antique architecture, and its streets crooked and dirty. It was formerly surrounded by ramparts flanked with high towers, some of which still remain; but the ramparts have been converted into promenades. B. has one of the noblest Gothic cathedrals in Europe, lighted by 59 splendid painted windows. Its university was suppressed at the revolution. B. has greatly prospered since the railway has reached it. In 1861, it was chosen to be one of the military arsenals of France, and its strategical importance has become greater since the loss of Metz. Pop. '76, 31,102. B. is of great antiquity, being the *Avaricum* of the Gauls, in the country of the *Bituriges Cubi*. Taken by Cæsar in 52 B.C.,

it was afterwards named *Bituriea*, and became the capital of the Roman province of *Aquitania Prima*. In the middle ages, it was the capital of the province of Berri. Charles VII. had his residence at B., when almost all France had been taken from him by the English; and its hôtel de ville was originally the abode of his unfortunate minister, Jacques Cœur. Louis XI. was born at B. Of the seven ecclesiastical synods held at B., that of 1438—in which the pragmatic sanction of the Gallican church was established with approbation of Charles VII., and the resolutions of the council of Basel, relative to the papal power and the king's prerogatives, were confirmed—was the most important.

BOURIGNON, ANTOINETTE, a celebrated religious visionary, b. at Lille 13th Jan., 1616. Her father was a merchant, and she inherited from him a considerable patrimony. She was so ugly an infant that there was some thought of killing her as a monstrous birth. Her intellect, however, was very acute, and its powers were early developed, along with a tendency to religious mysticism, which was much encouraged by the reading of mystic books, till her imagination became inflamed, and she began to fancy that she saw visions, conversed with God, received special revelations, and was called to restore the pure spirit of the gospel. By the good offices of the archbishop of Cambray, she obtained admission into a convent, where she won over some of the nuns to her opinions, and soon found herself at the head of a considerable party. She afterwards had charge of a hospital at Lille, but from this position she was driven in consequence of her extravagant fancies. She now traveled through various countries, her enthusiasm gaining proselytes, whose conversion, she said, caused the pains of childbirth in her person. At last she was appointed head of a hospital in e. Friesland. She died at Franeker, 30th Oct., 1680. According to Madame B., religion consists in internal emotion, and not in either knowledge or practice. Her own character exhibited a strange combination of pride and avarice, with a sort of mystic piety. She never gave anything to the poor, alleging as a reason that she had consecrated all to God. Some of her pretended revelations were of the most indecent nature; many of them were extremely ridiculous; yet many persons of intelligence and learning believed in them, and adopted the peculiar form of mysticism which soon began to receive the name of Bourignianism. Among the chief expounders of it was Peter Poiret, a Calvinistic minister. It spread to a remarkable extent both among Roman Catholics and Protestants; and about the end of the 17th c., and beginning of the 18th, prevailed so much in Scotland that a solemn renunciation of it was demanded from every entrant on the ministry at his ordination. A minister of Aberdeen was deposed for it in 1701. The formal renunciation of Bourignianism is still continued in the established church of Scotland, but has been given up as needless by other Presbyterian churches. The works of Madame B. were edited by Poiret (25 vols., Amst. 1676-84; 2d edit. 1717). They exhibit not a little fiery eloquence.

BOURMONT, LOUIS AUGUSTUE VICTOR DE GAISNE, Count de, a French marshal, and the conqueror of Algiers, was b. in 1773 at his paternal castle of Bourmont, in Anjou; went into exile at the revolution, served as an officer in the army of the prince of Condé, and from 1793 to 1796 was actively engaged in the anti-revolutionary struggle in La Vendée. Subsequently, he obtained the favor of the first consul. Under the empire he was appointed to a colonelcy in the army of Naples, and was soon raised to the rank of brig.gen. In the campaigns of 1813 and 1814, he distinguished himself upon a number of occasions, particularly in the battle of Dresden, and by the defense of Nogent, upon account of which Napoleon promoted him to the rank of a gen. of division. On 31st Mar., 1814, he declared for the Bourbons, and received the command of a military division during the first restoration; yet, on Napoleon's return, he went over to him, and was intrusted with the command of a division of the army of the Moselle. On the evening before the battle of Ligny, he deserted and betook himself to Louis XVIII., at Ghent. There can be no doubt that B. was singularly ungenerous in choosing such a moment to resign, nor is there anything in his career to make us suppose he was actuated by any high principle in what he did. His evidence went a considerable way in bringing about the condemnation and execution of marshal Ney. He received high military employment under Louis XVIII. Distinguishing himself in the chamber of peers as a zealous supporter of the king, he was appointed minister of war in 1829, and in this office displayed great activity. When the expedition against Algiers was undertaken in April, 1830, he received the chief command of the troops, and the rapid success of the expedition was ascribed to his prudence and energy. For this he received the marshal's baton on 22d July, but on the revolution taking place in that month, he was superseded in his command, and went to England to share the exile of Charles X. Refusing to take the legal oath, he was struck off the lists of the French army and peerage in 1832. In 1833, Dom Miguel of Portugal placed him at the head of his troops, but the campaign was brief and unsuccessful. B. finally settled on his estate in Anjou, and died there in Oct, 1846

BOURNE, HUGH, the founder of the sect of Primitive Methodists, was b. 3d April, 1772, at Fordhays, in Staffordshire. Originally a preacher among the Wesleyan Methodists, he distinguished himself by the fervor of his religious sentiments, and by the zeal which he displayed for the conversion of the ungodly. His enthusiasm for "revivals" and

open-air meetings, however, received no countenance from the leading clergymen of the denomination to which he belonged. In 1808, B. was cut off from the Wesleyan connection, strange to say, for following much the same course of earnest evangelization as Wesley himself had done. He was not, however, alarmed. His preaching was wonderfully acceptable, and he quickly gathered round him many devoted adherents. In Mar., 1810, a committee of ten members was formed. This may be regarded as the first official organization of the body. In 1818, B. published, in the *Primitive Methodist Magazine*, a narrative of his labors and those of his coadjutors. In the course of his life he visited Scotland, Ireland, Canada, and the United States, where his ministrations were attended with great success. He died at Bemersley, in Staffordshire, 11th Oct., 1872.

BOURNE, VINCENT, one of the most elegant Latin versifiers that England ever produced, was b. about the close of the 17th century. In 1714, he entered Trinity college, Cambridge; in 1721, he took his degree of A.M., and subsequently he was appointed usher in Westminster school. He died Dec. 2, 1747. It would be difficult to praise too highly B.'s exquisite contributions to Latin poetry. They will stand comparison, not only in point of Latinity, but also in point of originality, with the choicest productions of the ancient Roman poets. A gracefulness which pervades thought, sentiment, and expression, is their essential characteristic. The subject is indeed often insignificant, but the treatment is always perfect. His translations of English ballads and other lyrics into Latin are wonderfully felicitous, every beauty being retained with the most delicate skill, and every defect being most carefully remedied. Cowper, Beatty, Charles Lamb, and others have expressed their admiration of B.'s singularly fine *genius*, for assuredly a gift so rare as that which enables a man to find a complete utterance for his ideas in a dead tongue, deserves the name. The first edition of B.'s poems appeared in 1734. Their number was enlarged in a subsequent edition.

BOURNEMOUTH, an English watering-place on the Hampshire coast, 5 m. from Christ church; pop. '71, 5906. In 1855, a sanitarium for consumptive patients was erected, and several similar establishments have since been founded. The town has churches, hotels, a library and reading-room, and assembly rooms, baths, and a pier 800 ft. long. The climate is remarkable for equality of temperature. The surrounding country is very beautiful.

BOURNONITE, or ENDELLIONITE, is a triple sulphate of antimony, lead, and copper, in the proportions of 19.4 sulphur, 26 antimony, 41.8 lead, and 12.8 copper. It is found in massive crystals.

BOURNOUSE is the Arabic name of a garment worn in Algeria, Morocco, and other parts of n. Africa. It is a large woolen mantle, worn above the other attire of the natives, and having a hood, which is thrown over the head in rainy weather. The B. is generally white, though distinguished individuals wear it of various colors—blue, green, red, etc. It has been long in use among the Spaniards under the name of *albornoz*. Through the conquest of Algeria by the French, the B. was imported into France and England, although its original form has been considerably altered.

BOURRIENNE, LOUIS ANTOINE FAUVELET DE, the secretary and early friend of Napoleon I., was b. at Sens, 9th July, 1769, and received his education in the military school at Brienne, where he formed the closest intimacy with the future emperor. He became, in 1792, secretary to the embassy at Stuttgart. Deprived of this office by the breaking out of war, he lived for some time a rather retired life, until, in 1797, his former school-fellow appointed him his secretary. He accompanied him to Egypt and to Italy, and in 1801 was nominated a councilor of state. In 1802 he was dismissed from his office, for being implicated in the dishonorable bankruptcy of the house of Coulon, army-contractors; but in 1805 he was appointed ambassador to the states of the Circle of Lower Saxony, and in this capacity resided long at Hamburg. His tendency to peculation, however, necessitated his return to France, where he had to refund 1,000,000 francs into the public treasury. He now decidedly joined the party which sought the overthrow of the emperor and the restoration of the Bourbons. He was treated with little consideration by them during the first restoration, yet he followed Louis XVIII. in his flight to the Netherlands upon Napoleon's return, and upon the second restoration was honored with the title of a minister of state. As deputy from the department of Yonne in 1815 and 1821, he showed his weakness of character by opposing all liberal measures, and even institutions for the promotion of science and popular education. The revolution of 1830, and the loss of his fortune (occasioned by extravagance), caused his reason to give way, and he died in a lunatic asylum at Caen, 7th Feb., 1834. His Memoirs concerning Napoleon, the Directory, the Consulate, the Empire, and the Restoration (*Mémoires sur Napoleon*, etc., 10 vols., Par. 1829), gave many new explanations of his events of the time, but were declared by contemporaries to be in many respects untrustworthy. See the article BOULAY DE LA MEURTHE. The work, however, is one which must always constitute an important part of the materials of history. A work entitled *Histoire de Bonaparte par un Homme qui ne l'a pas quitté depuis 15 Ans*, has been erroneously ascribed to him.

BOURSAULT, EDMUND; 1638–1701; a French dramatist and satirist. Louis XIV. directed him to prepare a book for the education of the dauphin, and he produced *The*

True Study for Sovereigns, which so pleased Louis that he asked B. to become tutor to his son, but being ignorant of Latin he was compelled to decline. Two of B.'s dramas, *Esope à la Fille*, and *Esope à la Cour*, were very popular, and Carville declared one of his tragedies to be worthy of Racine. B. accused Molière of impiety, and assailed the *School for Women* in his *Portrait of a Painter*, to which Molière retaliated by contemptuously calling B. "L'Impromptu du Versailles." B.'s *Satyre des Satyres* was directed against Boileau, whom, however, he afterwards generously offered to assist; in return for which kindness Boileau erased B.'s name from his satires.

BOURSE. See EXCHANGE, *ante*.

BOUSSA, a t. of Sudan, Central Africa, capital of a district of the same name, is situated on an island in the Niger, in lat. 10° 14′ n., and long. 5° 20′ east. It is hemmed in by rocks, and being also surrounded by walls, is a place of very considerable strength. Pop. estimated at from 10,000 to 18,000. A melancholy interest attaches to B. as being the death-scene of Mungo Park (q.v.).

BOUSSINGAULT, JEAN BAPTISTE JOSEPH DIEUDONNÉ, a French chemist, particularly distinguished for investigations relative to agriculture, was born at Paris, 2d Feb., 1802, attended the mining school at St. Etienne, and went in the employment of an English mining company to South America, where, besides his professional and scientific labors, he served as a col. under Bolivar in the South American war of liberty. Returning to France, he was appointed professor of chemistry at Lyons, and in 1839 was admitted into the institute, and appointed to the chair of agriculture in the conservatory of arts and measures, Paris. In 1848, he was elected a member of the constituent assembly, and voted with the moderate republicans. After the *coup d'état*, he retired from political life. In 1857, he was made commander of the legion of honor. His *Economie Rurale* (2 vols., Par. 1844; 2d ed., Par. 1849) embodies the result of experiments and investigations which have won for him a European reputation. It contributed much to the promotion of the infant science of agricultural chemistry, and has been translated into English (Lond. 1845) and German. B. is the author of numerous valuable papers in scientific periodicals, which were collected and published in 1854; and he is also the author of *La Fosse à Fumier* (1858), and *Agronomie, Chimie agricole, et Physiologie* (1864).

BOUSSO'LE STRAIT passes through the Kurile islands, uniting the sea of Okhotsk and the Pacific ocean. Lat. 46° 30′ north. It takes its name from one of the vessels of La Perouse, who, soon after Cook's death, nobly emulated, on the n.e. coasts of Asia, that navigator's explorations on the n.w. shores of America.

BOUSTROPHE'DON (Gr. *bous*, an ox, and *strepho*, I turn), a word used to describe a mode of writing practiced by the Greeks in the earlier period of their history—viz., in which the lines did not proceed uninterruptedly from left to right, but alternately, the first line being written from right to left, the second from left to right, etc. Examples are frequently found in coins and inscriptions. The method received its name from its resemblance to the path made by oxen in plowing a field.

BOUTERWEK, FRIEDRICH, a German philosophical and æsthetical author of merit, was born on 15th April, 1766, at Oker, near Goslar, in the Harz district. He at first devoted himself to the study of law; but in the second year of his academic course at Göttingen he relinquished it, imagining that his proper vocation was to be a poet. Besides poems, he wrote the romance of *Count Donamar* (*Graf Donamar*, 3 vols., Gött. 1791–93; 2d ed., 1798–1800). Not finding, however, that success which he expected in this career, he renounced it, and devoted his whole energies thenceforth to the study of philosophy and of the history of literature. In philosophy, he was at first a zealous follower of Kant, but afterwards adopted the system of Jacobi. He began to give lectures in Göttingen in 1791, and became extraordinary professor of philosophy in 1797, and ordinary professor in 1802. He produced several works on philosophy; but his great work, on which his reputation really depends, is his *History of Modern Poetry and Eloquence* (*Geschichte der neuern Poesie und Beredsamkeit*, 12 vols., Gött. 1801–1819), one of the best works of its kind which Germany has produced. The part relating to Spanish literature is especially valuable, and has been translated into Spanish and much enlarged by Jos. Gomez de la Cortina and Nic. Hugelde de Molinedo (3 vols., Madrid, 1828). B. died at Göttingen in 1828.

BOUTS-RIMÉS (Fr. "rhymed endings") are a kind of verses the making of which forms a social amusement. Some one of the party gives out the rhymes or endings of a stanza, and the others have to fill up the lines as they best may. Suppose the rhymes prescribed are *wave, lie; brave, die;* the following are two of the ways in which the lines might be completed:

Dark are the secrets of the gulfing wave,
Where, wrapped in death, so many heroes lie;
Yet glorious death's the guerdon of the brave,
And those who bravely live can bravely die.

Whenever I sail on the wave,
O'ercome with sea-sickness I lie;
I can *sing* of "the sea," and look brave;
When I *feel* it, I *feel* like to die.

BOUTWELL, GEORGE SEWALL, LL.D., b. Mass., 1818; the son of a farmer, self-instructed after a common-school course; at the age of 18 a student at law, but never a practitioner, having turned his attention to politics. He was seven times chosen to the Massachusetts legislature, and became the leader of the democratic party in his state. He was three times defeated for congress, and once for governor, but was chosen governor in 1851 and re-elected the next year. On the repeal of the Missouri compromise he left the democratic and assisted in the organization of the republican party, in which he soon acquired a prominent position. In 1862, as commissioner, he organized the new department of internal revenue; in 1863, was elected to congress and twice rechosen. In 1868, he was one of the managers of the impeachment of president Johnson; from 1869 to 1873, secretary of the treasury, and then elected to the United States senate. In the financial business of the government, both as a legislator and an executive officer, Boutwell had a large share of influence and responsibility. He has also been overseer of Harvard college, and secretary of the Massachusetts board of education, in which capacity he prepared many valuable reports. He is the author of *Educational Topics and Institutions*, and a *Manual of the United States Direct and Revenue Tax*. His last political office was as a member of the Massachusetts constitutional convention of 1875.

BOUVARDIA, a genus of plants of the natural order *cinchonaceæ* (q.v.), and of the same tribe with the *cinchona* (q.v.), or Peruvian bark. The calyx is 4-partite, with teeth between the segments; the corolla tubular and 4-fid; the stamens 4, included within the corolla; the capsule 2-celled. The species are natives of Mexico. One of them, *B. triphylla*, with oblong ternate leaves and trigonous branches, has obtained a place among the favorite ornaments of flower-borders in Britain, but requires careful protection from frost. To preserve it, the roots are generally taken up, and are sometimes placed in a greenhouse or frame for the winter, sometimes in a dry cellar. Its beautiful corymbs of scarlet flowers are produced from June till November.

BOUVART, ALEXIS, 1767–1843; a Swiss astronomer, educated in Paris, and in 1804 a member of the bureau of longitudes. He assisted La Place in the *Mecanique Celeste*, and became a member of the academy. Bouvart was the first to point out the irregularities of the planet Uranus, and the investigation of these irregularities led to the discovery of Neptune by Le Verrier and Adams.

BOUVET, JAOCH., a learned French Jesuit, who was sent by Louis XIV. to China, to acquire information concerning that country, which he reached, along with five other missionaries, in July, 1686. Being invited to Pekin, the missionaries received permission to disperse themselves over the whole Chinese empire, except B. and Gerbillon, who were required to remain in attendance upon the emperor, the famous Kanghi, whose respect and confidence they soon acquired in a high degree. He committed to them the erection of great buildings, and was so pleased with their performances, that he not only caused a church and a residence for them to be built within the bounds of his palace, but commissioned B. to return to his native country, and to engage as many missionaries as he could find. B. arrived in France in 1697, and brought with him, for the king, about fifty Chinese works. He returned again to China in 1699 with ten new missionaries, amongst whom was the learned Parrenin. He died at Pekin, June 28, 1722, after having labored indefatigably in the cause of science, in that distant scene, for fifty years. He has left four different accounts of his various travels, and a work entitled *Etat Présent de la Chine, en Figures Gravées, par Griffart* (Par. 1697).

BOVEY COAL is a form of wood-coal or lignite, which derives its name from being found at Bovey, in Devonshire.

BO'VIDÆ (Lat. *bos*, an ox), a family of ruminating mammalia (see RUMINANTIA), to which different limits have been assigned by different naturalists, but which is generally regarded as equal in extent to the Linnæan genus *bos*, or to what is popularly called the ox tribe. The B. are all large animals, with stout limbs and broad muzzle. The facial outline is nearly straight. Their dentition agrees with that of some of the other ruminants, as sheep, goats, and antelopes: they have eight cutting-teeth in the lower jaw, and none in the upper, but instead of them, a fibrous and elastic pad, which covers the convex extremity of the anterior maxillary-bone; they have no canine teeth, but a large interval between the cutting-teeth and the grinders, which are six on each side in each jaw. In eating, they collect and roll the grass together "by means of the long and movable tongue; it is firmly held between the lower cutting-teeth and the pad, the cartilaginous upper lip assising in this; and then, by a sudden nodding motion of the head, the little roll of herbage is either torn or cut off, or partly both torn and cut." Both sexes are furnished with unbranched tapering horns, which are directed more or less laterally, and generally upwards and forwards, and are usually curved throughout their whole length. There are, however, breeds of the common ox, in which both sexes are destitute of horns. The tail is rather long, and terminated by a tuft of long hair. The females have four teats. All the B. are gregarious. Native species are found in Europe, Asia, Africa, and North America. Fossil remains of species which no longer exist have been found in pliocene and pleistocene deposits. The number of existing species is by no means certain; as, besides the difficulty of deciding in some cases what are to be deemed species, and what merely varieties, there is still a great deficiency of

accurate information concerning the B. of different parts of the world. The very magnitude of the animals has probably prevented so frequent a comparison of specimens as would otherwise have taken place. It has recently been ascertained that the number of species is more considerable than had been supposed. Attempts have been made to divide the genus *bos* into several genera, but they are not very clearly nor strongly distinguished. All the B. are valuable to man, for their flesh, tallow, skin, etc.; but some of them, having long been reduced to domestication, are among the most valuable of all domestic animals, particularly the common ox, different kinds of buffalo, and the yak of Tartary.—See ARNEE, BANTENG, BISON, BUFFALO, GAUR, GAYAL, GALLA OX, MUSK OX, OX, PEGASSE, URUS, YAK, ZAMOUSE, ZEBU, etc.

BOUVIER, JOHN, 1787–1851; b. France; of a Quaker family; practiced law in Philadelphia, and became associate justice of the court of criminal sessions. In 1839, he published a *Law Dictionary*, which was accepted as a standard work, especially adapted to this country. His chief effort, however, was the *Institutes of American Law*. An only daughter, Hannah M., became proficient in astronomical sciences, and published *Familiar Astronomy*, with a *Treatise on Globes*.

BOVALI, BOUALI, or BOALI, a t. in Africa, capital of the kingdom of Loango, in 4° 30′ s., and 12° 1′ e., on a river of the same name, not far from the coast. It is in a fertile but unhealthy region, and has a large trade in pepper, ivory, dye-woods, and slaves. Pop. 15,000.

BOVIA'NUM, a city of ancient Italy, near the site of the present Bojano, believed to have been founded by the Samnites, and represented by Livy as a rich and powerful town. It was captured by the Romans, 311 B.C.; in the second Punic war it was the head-quarters of the Roman army, and in the Social war the capital of the confederates.

BOVINES, or BOUVINES, a village in Flanders, 7 m. s.e. of Lille, on the Marcq, where, July 27, 1214, Philip Augustus of France, defeated Otho IV. of Germany. In 1240, Philip of Valois defeated the English, and May 18, 1794, the French defeated the Austrians, at the same place.

BOVINO, a fortified t. in the province of Foggia, s. Italy, about 20 m. s.s.w. of Foggia. It is the see of a bishop, has a cathedral, churches, and convents. The valley of B. was formerly notorious as the haunt of the brigands of Capitanata, and the town still enjoys the unenviable reputation of being the nursery of all the highway robbers of this portion of the Apennines. Pop. 7900. B. occupies the site of the ancient *Vebinum*. The imperialists defeated the Spaniards here in 1734.

BOW, of a ship, is a general name for the forepart, or that which breasts the waves. Very often the word is used in the plural, the ship being considered to have starboard and larboard, or right and left bows, meeting at the prow or figure-head. A narrow or *lean* bow, and a broad or *bluff* bow, are seamen's phrases for different shapes of bow, each of which has its own peculiar advantage at sea: a narrow bow will cut more smoothly through the water, but a broad bow bears up more firmly in a high sea.

"On the bow," in sea-language, is the position of a distant object when seen over the bow; it implies a sweep of one quarter of the horizon, embracing about 45° on each side of the prow or head.

BOW AND ARROW. In ARCHERS AND ARCHERY will be found a brief account of the military arrangements under which bowmen formed a component element in the armies of the middle ages; and under ARBALEST is a description of the cross-bow, which was once so favorite a weapon. We here describe the more effective, though simpler implement. The long-bow first gained ascendency in England in the 14th century. It was found that a dozen arrows could be discharged from this weapon while the arbalester was winding up his cumbrous cross-bow, and discharging one arrow or quarrel from it. Moreover, the long-bow being held vertically, the bowmen were able to stand in closer array than the arbalesters; they were enabled also to take a greater supply of the munitions of war into the field, seeing that the bow and arrows were much lighter in weight. In the time of Edward III., a bow was priced 1*s.* to 1*s.* 6*d.*, and a sheaf of arrows, 1*s.* to 1*s.* 2*d.*; in the time of Henry VIII., the price (fixed by law) of the bow varied from 6*d.* to 3*s.* 4*d.* The last-named monarch adopted extraordinary means for encouraging the use of the long-bow. Many ordinances were issued for insuring a good supply of bow-staves. The bowyers, string-makers, fletchers, and arrow-head makers were all placed under stringent regulations. Merchants were compelled to import good bow-staves with cargo, in certain proportions. Very long bow-staves were admitted duty-free. Yew was considered the best wood; but in order that the supply should not be too speedily used up, bowyers were ordered to use elm, ash, and wych-hazel in certain proportions to yew. The heads of families were bidden to provide bows for their sons and servants; and town-councils or officers were required to provide shooting-butts just outside each town. Some of the bows had two arches, connected by a middle straight piece. The best length was regarded as about 5 ft. 8 in. from nock to nock; but in earlier times, some of the bows were much longer. The first arrows were made of reeds; these materials were afterwards superseded by cornel-wood; but the wood finally adopted as the best was ash. The arrows had heads pointed with steel, sometimes barbed to render their action more terrible. They were feathered with portions of goose-wing. The best

length for a bow of the above-named size was set down at 2 ft. 3 inches. Sometimes the arrows were tipped with combustibles. The best makers of arrow-heads, as well as bows, were compelled by law to go from town to town, to exercise their craft wherever it was most needed. The bowman usually carried 24 arrows, called a sheaf, or a quiver, at his right side or at his back; besides others in his girdle. He kept his bow in a case; hence Falstaff's comparison of prince Hal to a bow-case, in allusion to his slenderness. Bowmen, in their hours of sport, used arrow-heads called *rigged, creased, shouldered*, and *spoon-headed*, according to the shape.

The circumstances attending the decline of the use of the long-bow are narrated in the articles above cited.

BOWDICH, THOMAS EDWARD, an enterprising African traveller, b. at Bristol in June, 1790, was first engaged in trade in his native city, but afterwards appointed a writer in the service of the African company. Selected, in 1816, to conduct a mission to the king of Ashantee, he published an account of it in 1819, 4to. On his return to Europe he resided for some years in Paris. To obtain funds for a new expedition into the interior of Africa, he published a translation of Mollien's *Travels to the Sources of the Senegal and Gambia*, and other works, and in Aug., 1822, sailed from Havre. He died of fever on the river Gambia, Jan., 10, 1824. A profound scholar and accomplished linguist, B. was a member of several literary societies both in England and on the continent.

BOWDITCH, NATHANIEL, an American astronomer of some note, b. 26th Nov., 1773, at Salem, in Massachusetts. He showed at a very early age a great inclination for mathematics, in which he afterwards made great proficiency, without ever attending a university. He was at first bred to his father's trade of a cooper, and afterwards apprenticed to a ship-chandler. He acquired Latin that he might study Newton's *Principia*. He particularly devoted himself to the study of the practical applications of science. He went as supercargo of a merchant-ship in several long voyages, and added a thorough practical acquaintance with navigation to a theoretical knowledge of it. His work, *The American Practical Navigator*, was received with great favor. He published also an admirable translation of La Place's *Mécanique Céleste* (2 vols., Boston, 1829), to which he added valuable annotations. These works obtained for him marks of honor from scientific societies in Britain, and led to his being called to the professorship of mathematics and astronomy in Harvard college, in his native state, which situation, however, he declined, in order to enter the executive council of the state. He afterwards became manager of the Massachusetts life insurance association, president of the mechanics' institute, and president of the academy of arts and sciences in Boston. He died 16th March, 1838.

BOWDOIN, JAMES, LL.D., 1727–90; b. Boston; a descendant of Pierre Bowdoin, Huguenot refugee from France; a graduate from Harvard in 1745; representative in the general court, senator, and councilor. He was an early opponent of English oppression, and in 1775 he was chosen president of the colonial council of government. In 1778, he presided over the convention to form a constitution. In 1785, he was chosen governor, succeeding John Hancock in that office. He proved his executive ability by a prompt suppression of the "Shay's rebellion." In 1789, he was a member of the convention that ratified the federal constitution. B. was one of Franklin's friends and correspondents; and one of the founders, and the first president, of the academy of arts and sciences, to which he gave his library. He also left a legacy to Harvard college, and was a liberal patron of the state humane society. The oldest college in Maine bears his name.

BOWDOIN, JAMES, 1752–1811, son of gov. Bowdoin; a graduate of Harvard, studied also at Oxford, and traveled in Europe, returning to America soon after the battle of Lexington. In 1805, he was United States minister to Spain. He left to Bowdoin college 6000 acres of land, with the reversion of the island of Naushon, and also a large library and extensive collection of philosophical apparatus.

BOWDOIN COLLEGE, the oldest and one of the most important seats of learning in Maine, in the village of Brunswick, near the Androscoggin river and the ocean, named after James Bowdoin, gov. of Massachusetts, of which state Maine was formerly a province. The charter was granted by the Massachusetts legislature in 1794, and five townships of land were given towards the foundation. The object of the institution, in the language of the charter, was "to promote virtue and piety, knowledge of the languages, and of the useful and liberal arts and sciences." A dual government was formed, consisting of a board of trustees and a board of overseers. Joseph McKeen, a Dartmouth graduate, was the first president, chosen in 1801, and John Abbott, a Harvard graduate, was made professor of languages. Eight students were accepted in 1802, and in 1806 the first honors of the new college were conferred upon eight graduates. At this time the entire college and the residences of professors were in a single house. On the death of president McKeen in 1807, Jesse Appleton, D.D., became president, and held the chair for twelve years, during which time he did much to advance the efficiency and importance of the institution. James Bowdoin, son of gov. Bowdoin, had given the college 1000 acres of land and about $5000, and at his death gave, in addition, more land and many valuable mineralogical specimens, books, and paintings. William Allen, D.D., who had been president of Dartmouth college, was the next president (1819). He was in office for twenty years, except for a short period in 1831, when he had a con-

troversy about authority with the newly organized state of Maine. The controversy was ended by a decision in his favor by the U. S. circuit court. After Dr. Allen, Leonard Woods, D.D., was president until 1866. He was followed by Samuel Harris, S.T.D.; and in 1871, Dr. Harris gave place to Joshua L. Chamberlain, LL.D. At the present time there are six or more spacious and well-arranged brick buildings, besides the chapel and memorial hall, which are of granite. The college is governed by 11 trustees and 40 overseers, the president and vice-president being two of the trustees. At the latest reports, there were 12 professors and 140 students. The curriculum is of the usual variety, some of the languages, however, being optional. For undergraduates there is a scientific course, in which the degree of B.S. is conferred. There is a post-graduate course of two years in philosophy and the arts. Those of the graduates who have honorably finished a post-graduate course may be appointed fellows, and reside at the college two years, with all the privileges, without further charge. Military instruction is also given. The medical school has 9 professors and 93 students. Among the benefactors of the college, besides James Bowdoin, have been Mrs. Amos Lawrence, and Daniel W. Lord of Kennebunkport. Of notable graduates there may be named Hawthorne and Longfellow, who had among their fellow-students William Pitt Fessenden, George B. Cheever, D.D., Franklin Pierce (president of the United States), John P. Hale, Sargent S. Prentiss, Calvin E. Stowe, D.D., and Luther V. Bell. Mr. Longfellow was professor of languages until he removed to Harvard. The prevailing religious sentiment of the college is Congregational.

BOWEN, FRANCIS, LL.D., b. Mass., Sept. 8, 1811; graduate of Harvard, and instructor there in political economy and intellectual philosophy. In 1843, he became editor of the *North American Review*, in which capacity he acted 11 years. In 1850, he was proposed for professor of history in Harvard, but was not appointed, his views on the Hungarian revolt and other political topics being unsatisfactory to the board of appointment. In 1853, he succeeded Dr. Walker in the Alford professorship of natural religion, moral philosophy, and civil polity. He has lectured and published largely on the application of ethical and metaphysical science to the evidences of religion, on political economy, on the origin and development of English and American political constitutions, on English philosophers, etc., and opposing Mill, Comte, Kant, Cousin, and Fichte. Some of his works are: *Critical Essays on the History and Present Condition of Speculative Philosophy; Principles of Political Economy applied to the Condition, Resources, and Institutions of the American People;* an annotated edition of *Virgil*, and a revision of Reeves' translation of De Tocqueville's *Democracy in America*.

BOWER (Ang.-Sax., *bur*, a chamber). The "ladies' bower," a private apartment in ancient castles and mansions, used by ladies both as a parlor and sleeping-chamber.

> Up, then, rose fair Annet's father,
> Twa hours of it were day,
> And he is gane into the bower
> Wherein fair Annet lay.
> Ballad of *Lord Thomas.—Percy's Reliques.*

BOWERBANK'IA, a genus of zoophytes (q.v.), of the class *polyzoa* or *bryozoa*, order *infundibulata*, the structure of which has been very carefully studied in the common British species, *B. imbricata*, one of the most abundant zoophytes on the coasts of both England and Scotland. It grows on sea-weeds, corallines, stones, etc., between high and low water-mark, or in no great depth of water, and forms branching tufts sometimes 1½ in. in height. The branches are smooth and transparent, tubular, filled apparently with a granular fluid, and crowded with irregularly scattered clusters of delicate horny ovate or ovato-cylindrical cells, which are so transparent as to permit the most easy observation of their whole internal structure. The polyps which inhabit these cells are all connected with the tube of the branch, and so with the common life of the *polypidom*. Each, when fully expanded, is about one twelfth of an inch in length, and has 10 finely ciliated tentacula. When alarmed, it contracts very rapidly, the tentacula being first drawn in, and then the body of the polyp retracted into its cell. The organization is much higher than in many zoophytes. The mouth does not lead at once into the stomach, but into a funnel-shaped tube, which contracts into a gullet or *œsophagus*, and ends in a globular gizzard, apparently provided with radiating muscular fibers, and intended for trituration of the food. The gizzard opens below into a bag, which is regarded as the true stomach, and is supplied with a fluid, regarded as bile, from minute follicles or sacs in its sides, which follicles are therefore regarded as representing the liver. From the upper part of the stomach, near the entrance from the gizzard, arises the intestine, a straight tube which passes up by the side of the gullet, and terminates in an orifice outside the circle of tentacula; the structure thus exhibiting a strong resemblance to that of the ascidian mollusca. When the polyp is retracted, the gullet is bent upon itself, and the tentacula are inclosed in a tube or sheath formed by the inverted integument. When the polype is vigorous and lively, the cilia of the tentacula are kept in active motion, apparently quite under control of the will of the animal, forming a kind of whirlpool to bring animalcules or organic particles into the mouth.

BOWER-BIRD, a name given to certain Australian birds of the starling (q.v.) family, or *sturnidæ*, remarkable for their habit of making bower-like erections, called *runs* by

the colonists of New South Wales, and for adorning them with gay feathers, rags, bones, shells, and such other white or brightly colored objects as they can pick up. These bowers are not used as nests, but they appear to be places of much resort at the breeding-season in particular. The use made of them by the birds is very imperfectly understood; but their structure has been carefully examined, and fine specimens of them, transported with no little difficulty, have been deposited in the British museum by Mr. Gould, in whose work on the *Birds of Australia* an account of them was first given to the world. The bowers of the satin bower-bird (*ptilonorhynchus holosericeus*) are built among the branches of some tree, and appear to be repaired and frequented from year to year. The base consists of an extensive and rather convex platform of sticks, firmly interwoven, on the center of which the bower itself is built of more flexible twigs. It is chiefly at and near the entrance that the shells, feathers, etc., employed for decoration are are placed. The bowers of the spotted bower-bird (*chlamydera maculata*) are longer and more avenue-like than those of the satin bower-bird; they are placed upon the ground, and are outwardly built of twigs, and beautifully lined with tall grasses so disposed that their heads nearly meet. The decorative propensity appears in the highest degree in this species. "In some of the larger bowers, which had evidently been resorted to for many years," Mr. Gould says, "I have seen nearly half a bushel of bones, shells, etc., at each of the entrances." These are arranged in much the same way at both entrances. Small pebbles are often transported by the birds from considerable distances.

The satin bower-bird is particularly abundant in the mountainous districts of the w. of New South Wales, and is found in all the "brushes" from the mountains to the coast. The adult male has the whole plumage of a deep, shining black. The colors of the female are grayish-green and brown, curiously mingled.—The spotted bower-bird, which is rather smaller than the satin bower-bird, or about the size of a starling, has a general color of rich brown, beautifully marked with black and buff; a band of elongated feathers of light rose-pink crossing the back of the neck, and forming a broad, fan-like, occipital crest. It is exclusively an inhabitant of the interior of Australia.—Another species, the great bower-bird (*chlamydera nuchalis*), considerably larger than either of the others, and very similar in form and plumage to the spotted bower-bird, has been found on the n.w. coast of Australia. Its bowers are always adorned with sea shells, even when at a distance from the sea.

BOWIE, a co. in n.e. Texas, on the Red river and the Arkansas border; intersected by the Texas and Pacific railroad; 892 sq.m.; pop. '80, 10,965—4,292 colored. It has an undulating surface, with rich bottom-lands, and heavy forests; productions, cotton, corn, sweet potatoes, etc. Co. seat, Boston.

BOWIE-KNIFE, an American knife, so called from its inventor, col. Jim Bowie, a famous fighter with the rifle and other weapons, and altogether one of the most daring characters in the southern states of the union. The bowie-knife is a sharp-pointed weapon, and is usually carried concealed in a sheath in the breast, or some other part of the person, ready for any encounter.

BOWIE-KNIFE, (*ante*), a common hunting knife used by south-western pioneers, improved by col. James Bowie, who has been wrongly represented as a bully and a duelist. The bowie-knife is seldom concealed, and it is by no means the commonly used weapon which it is represented to be by foreigners; indeed, of late years it is seldom seen at all unless among hunters or settlers in the extreme frontiers.

BOWING TOWARDS THE ALTAR is an ancient practice in the church, derived from a belief in the superior sanctity of the east. There are scriptural allusions to the east, from which notions of this kind may have been drawn. "And, behold, the glory of the God of Israel came from the east."—*Ezek.* xliii. 2. "For we have seen his star in the east."—*Mat.* ii. 2. There was also an early legendary belief that Christ would come to judgment in the east. For these, not to mention other reasons, it became customary to place the altar, with the crucifix and other symbols, at the eastern extremity of the church, to which all bowed. In the Romish church, the practice is still kept up of bowing towards the altar, or more correctly towards the Host, on entering and departing from the church. Brand's *Popular Antiquities*, edited by sir Henry Ellis, contains much curious antiquarian lore on this subject. It was further a custom in the early Christian church to bow at the name of Jesus. This is still done in the church of Rome, at whatever part of the service the name occurs. In the church of England, it is customary to bow at the name of Jesus only in repeating the *creeds*. This ancient usage is traced to *Phil.* ii. 10, "That at the name of Jesus every knee should bow." Punctilious bowings and turning towards the east in repeating the *creeds*, have in late times given rise to dissensions in the church of England.

BOW ISLAND, an island of coral formation in the s. Pacific, the largest in the Low archipelago, being about 30 m. long and 5 m. broad. It can only be approached by a small opening in the reef at the n. end. Within the lagoon the anchorage is safe. The e. side is well wooded, but the w. is low and barren. Pearl-oysters and other shell-fish abound in the lagoon. The inhabitants are few, ill-looking, and indolent, with a partiality for raw food. The island was first discovered in 1768 by Bougainville, who gave it the name of La Harpe, which Cook, who visited it in the following year, changed to the name it now bears.

BOWLDERS. See BOULDERS, *ante.*

BOWLES, SAMUEL, 1826–78; b. Mass.; a journalist, for more than 30 years editor of the *Springfield* (Mass.) *Republican*, which he made in some respects the leading journal in New England. He traveled widely over the United States, and was always warmly interested in political affairs, though never holding office. As a practical editor Bowles stood in the first rank, satisfied with nothing less than the best work, sparing neither his own nor his subordinates' strength, not hampered in his work by either fear or friendship. He was an accomplished and fascinating conversationist, cosmopolitan in taste, and liberal in opinion. His travels gave rise to the volumes *Across the Continent; Our New West,* and *The Switzerland of America*, which, with his numerous editorial writings, show him a master of clear and vigorous English.

BOWLES, WILLIAM LISLE, D.D., an English poet, was b. 24th Sept., 1762, at King's Sutton, in Northamptonshire, where his father was then vicar. He received his education at Winchester school, and at Trinity college, Oxford, and became at last a prebendary of Salisbury cathedral in 1803, and rector of Bremhill, in Wiltshire, in 1805. Here he spent, in comparatively affluent circumstances, the remainder of his long life. His poetical career began with the publication, in 1789, of *Fourteen Sonnets, written chiefly on Picturesque Spots during a Journey.* This unpretending little volume was received with extraordinary favor; the sonnets were fresh and natural, and to many minds, all the more charming because of the contrast which they presented to the style of poetry which had long been prevalent. Coleridge, Wordsworth, and Southey were among their enthusiastic admirers; and through the influence which he exercised over them, B. may be regarded as the founder of a school of English poetry, in which their names soon became greater than his own. The subsequent poetical works of B. are very numerous, of which *The Spirit of Discovery* and *The Missionary* are generally regarded as the best of his longer blank-verse poems. As a poet, B. shows a fine appreciation of the beauties of nature, and pleases by the expression of pure and generous sentiment, as well as by playfulness of fancy and perfect scholarly correctness, but he is greatly deficient in vigor and depth. He published an edition of Pope's works in 1807; and an opinion which he expressed on the poetical merits of Pope, led at a subsequent period to a rather memorable controversy, in which Campbell and Byron were his antagonists, and which turned chiefly upon the comparative value in poetry of images derived from nature and those derived from art. B. was generally admitted to have discomfited his opponents. B. frequently employed his pen in defense of the church of England, and endeavored to vindicate all the peculiarities of the older English educational institutions. Of his prose writings may be mentioned a volume of sermons (Lond. 1826), and a rather dry *Life of Thomas Ken, deprived Bishop of Bath and Wells* (2 vols., Lond. 1830–31). B. died at Salisbury on 7th April, 1850, in the 88th year of his age.

BOW-LINE, in a ship, is a rope fastened near the middle of the perpendicular edge of the square sails by three or four subordinate ropes called *bridles.* It is employed to tighten the edge of the sail in a particular direction during an unfavorable wind.

BOWLING GREEN, a t. and seat of justice of Warren co., Ky., 120 m. s.w. of Frankfort, on Barren river, which is navigable to the place by steamboats. Pop. about 6000. It has some manufactures, and trade in tobacco, pork, etc. It is reached by the Louisville and Great Southern railroad.

BOWLS, GAME OF. This is a favorite pastime throughout the British isles. It is played upon a smooth, flat piece of turf, from 40 to 60 ft. square, surrounded by a trench or ditch about half a foot deep. The players arrange themselves in sides, usually of four each, and each man is usually provided with two bowls. The bowls are made of lignum-vitæ wood, of 6 or 8 in. in diameter, nearly round, and with a bias to one side. A smaller ball, perfectly spherical and white, is placed at one end of the bowling-green; this is termed the *jack*, and the aim of the players, who stand at the other end of the green, is to send their B. that they may lie as near as possible to the jack. The side whose B. are nearest the jack reckon one point for each bowl so placed. 7, 14, 21, or 31, make game, according to mutual arrangement beforehand. B. are biassed or weighed on one side, that the player may reach the jack by a curved instead of a straight course, an expedient which the nature of the game renders particularly desirable. Indeed, were it not for this, the game would lack half its charms. A bowl is played *forehand*, when it is so placed in the hand and delivered as to cause it to approach the jack with a curve from the right; and in order to attain this curve, the bowl must be held so that its bias is on the left or in-side. Backhand is the reverse. If a bowl goes into the ditch without touching the jack, it cannot count in the scoring of that end; but if it strikes the jack, and then rolls into the ditch, it reckons as if on the green. When the jack is carried by a bowl into the ditch, it is usually lifted, and placed on the green as near as possible to its position in the ditch. When the B. have so accumulated round the jack, that it is impossible to approach it from either *side*, without running the risk of touching an adversary's bowl, the last player frequently endeavors to *run* the jack, by playing straight at it with such force as to neutralize the bias, and, if fortunate, carry away the jack

from the neighborhood of his opponent's bowls. A *skip* is appointed on each side, whose duty it is to direct each of his men.—For BOWLING at cricket, see CRICKET.

The game of B. was anciently unlawful, and was the subject of prohibitive legislation in England in the reign of Henry VIII.; but the law then enacted was repealed in 1845 by the 8 and 9 Vict. c. 109, s. 1, so that B. or other similar games of mere skill may be legally indulged in by the people.

BOWMAN, THOMAS, D.D., b. Penn., 1817; graduate of Dickinson college, and a minister in the Methodist Episcopal church. He organized Dickinson seminary, at Williamsport, Pa., and presided over it for ten years. In 1858, he was chosen president of Asbury university, at Greencastle, Ind.; he was a delegate to the Bristol conference in 1864, and chaplain to the U. S. senate in that and the following year. In May, 1872, he was made a bishop.

BOWMANVILLE, a t. in Canada, on lake Ontario and the Grand Trunk railroad, 43 m. n.e. of Toronto. It has manufactories driven by water-power, and trade by the lake. Pop. 3000. The harbor is port Darlington, 2½ m. from the town.

BOWRING, Sir JOHN, an English politician, linguist, and author, was b. at Exeter, 17th Oct., 1792. He early devoted himself to the study of languages, in the acquisition of which he displayed an unusual degree of talent. The national poetry of different peoples had particular attractions for him, and he rendered great service to literature by collecting and translating both the more ancient and the more modern popular poems of almost all the countries of Europe. His translations preserve remarkably well both the meaning and the spirit of the original, and exhibit no mean powers of versification. B. was very intimately associated with Jeremy Bentham, who appointed him one of his executors, and intrusted him with the editing of his collected works. A descendant of the old Puritans, he early came forward in writing and speaking against the political disadvantages experienced by dissenters. He took part from the first in the *Westminster Review*, which was established in 1824, and edited it for about five years from 1825. In 1828 he visited Holland; and his letters—which appeared in the *Morning Herald*, and were shortly afterwards translated into Dutch—procured for him the degree of doctor of laws from the university of Groningen. Subsequent travels were undertaken by him, on a commission from the British government, to inquire into the commercial relations of certain states. He visited Switzerland, Italy, Egypt, Syria, and finally the countries of the German Zollverein, and everywhere found materials for valuable reports. He was a member of the house of commons from 1835 to 1837, and again from 1841 to 1849, and actively promoted the adoption of free trade. In 1849, B. was appointed British consul at Hong-Kong, and superintendent of trade in China. He returned in 1853, and in the following year was made knight and governor of Hong-Kong. In 1856, an insult having been offered to a Chinese vessel said to have been under the protection of the British flag, B., without consulting the home government, ordered an attack on certain Chinese forts, a proceeding which excited considerable dissatisfaction in the country, and produced a ministerial crisis. B. afterwards returned to England. In 1855, he concluded a commercial treaty with Siam, and has given an interesting account of his visit in a work entitled *The Kingdom and People of Siam*. He retired on a pension in 1859, and afterwards published an account of the Philippine islands. In 1861, B. was sent on an official mission to Italy. He died in 1872. His *Autobiographical Reminiscences* were published in 1877.

BOW SPRIT is a large boom, spar, or mast, which projects over the stem or head of a ship. Its use is to carry sail forward, as a means of counteracting the effect of the after-sails, and keeping the ship well balanced. It is also the chief support of the fore-mast, which is fastened to it by large stays or ropes. In ordinary ships of war, the B. rises at an angle of about 45° from the horizon, and is generally about two-thirds as long as the main-mast; but in many kinds of vessels the position is more nearly horizontal.

BOWSTRING HEMP, an English name, proposed by Dr. Roxburgh, and partially adopted, for the fiber produced by *sanseviera zeylanica*, a plant of the natural order *Liliacea* (q.v.), tribe *hemerocallea*, a native of the East Indies. The employment of the fiber for making bowstrings led to this name. Dr. Royle prefers to use the Sanscrit name MOORVA, on account of the confusion apt to be caused by applying the term hemp to a variety of fibers.—The genus *sanseviera* is distinguished by a colored funnel-shaped perianth, with a long tube, into the throat of which the stamens are inserted, and a 3-celled and 3-seeded, or abortively 1-celled and 1-seeded, berry. The plants have a general appearance much like that of many species of *iris*, but their leaves are more fleshy; they have a thick creeping rhizome or root-stock; the radical leaves are long and narrow, and the flowering-stems have only scale-like leaves.—Very similar to *S. zeylanica* are *S. Roxburghiana* and *S. lanuginosa*, also natives of India.—These plants grow under bushes in jungles near the sea, where the soil is salt, but may easily be propagated on almost any soil by the shoots which issue in great abundance from the root-stock. They are perennial. The leaves are about 2 ft., or in cultivation 3 or 4 ft. long; the fibers extend their whole length; and to separate the fibers from the pulpy part of the leaves, "the natives place them on a smooth board, then press one end of the leaf down with

one of their great toes, and with a thin bit of hard stick, held between the two hands, they scrape the leaf from them, and very quickly remove every part of the pulp." Steeping in water is also practiced, but it discolors the fiber, which is beautifully white. One pound of clean fiber is obtained from about 40 lbs. of fresh leaves. Dr. Roxburgh calculated that 1 acre would yield 1613 lbs. of clean fiber at a gathering, of which two might be reckoned upon annually in good soil and favorable seasons, after the plants have reached a proper age. Moorva, or B. H., may well be supposed likely to acquire commercial importance. The fiber is hair-like and silky, elastic, and in strength apparently about equal to hemp. It does not rot in water so soon as hemp.—A species of *sansevieria* very similar to the Indian ones, *S. Guineensis*, is found in abundance along a great extent of the w. coast of Africa, specimens of the fiber of which, also fine and strong, have been brought to England under the name of AFRICAN BOWSTRING HEMP.

BOWYER, WILLIAM, an eminent English printer and classical scholar, b. in London in 1699, was educated at Cambridge, and in 1722 joined his father in trade. Appointed, in 1729, printer of the votes of the house of commons, he subsequently became printer to the society of antiquaries, and to the royal society. In 1767, he was nominated printer of the rolls of the house of lords, and the journals of the house of commons. He died in 1777. B. published several philological tracts, but his chief production was an edition of the New Testament in Greek, with critical and emendatory notes. He left a considerable sum in trust to the stationers' company, for relief of decayed printers. A small volume of anecdotes of B. and his learned contemporaries, published soon after his death by Mr. John Nichols, his apprentice and partner, was afterwards enlarged, under the title of *Literary Anecdotes of the Eighteenth Century* (9 vols., 8vo).

BOX, *Buxus*, a genus of plants of the natural order *euphorbiaceæ;* evergreen shrubs or small trees, with opposite leaves, entire at the margins, and easily split into two plates. The greenish inconspicuous flowers grew in little axillary clusters, the male and female flowers distinct, but on the same plant. The male flowers consist of a perianth of four leaves, and of four stamens; the female flowers have a perianth of three or four leaves, and, in addition, three small bracts at the base, an ovary surmounted by three styles, and two honey-secreting glands. The capsule has three beaks and three cells, and two or three black seeds in each cell.—The most important species is the COMMON BOX (*B. sempervirens*), which grows wild in the s. of Europe, and in some parts of Asia. It is generally regarded as a true native of the s. of England, where it grows on dry chalky hills; and is remarkable as the only arborescent species of *euphorbiaceæ* found in such cold latitudes. In Britain, it seldom attains a height of more than 12 or 14 ft., but in warmer countries, it is often twice that height. Its leaves are oval, generally from half an inch to three quarters of an inch in length, smooth and shining, of a deep green color. The B. is remarkable for its compact habit of growth and densely crowded branches and leaves, presenting a very solid mass of foliage. There are several cultivated varieties, distinguished by differently variegated leaves—gold-edged, silver-edged, etc. The most interesting variety, however, is a very humble one, called DWARF BOX, which grows only to a height of 2 or 3 ft., and is very commonly used to form edgings for garden-plots, being kept down by clipping to the height of a few inches. These edgings—than which none are neater, or better serve the purpose of keeping gravel-walks free from earth—are generally formed by planting cuttings, which readily strike root. The B. bears clipping remarkably well; and in a style of gardening once fashionable, but condemned by the taste of the present day, it occupied an important place, being cut into architectural and fantastic figures. The leaves of the B. have a smell which is disagreeable to many people, and a very disagreeable bitter taste. When taken inwardly, they cause purging; an external application of them promotes the growth of the hair. In France, they are sometimes used instead of hops in making beer, but are extremely improper for the purpose. The wood of the B. is heavier than that of any other European tree, and is the only European wood that sinks in water. It is of a beautiful pale-yellow color, remarkably hard and strong, of a fine regular and compact texture, capable of a beautiful polish, and not liable to be worm-eaten. It is much valued for the purposes of the turner and the wood-carver; is preferred to every other kind of wood for the manufacture of flutes, flageolets, and other wind-instruments, as well as of mathematical-instruments; and is unrivaled for wood-engraving, admitting of a finish as sharp and fine as metal, whilst it *takes the ink* much better. See ENGRAVING. When scraped down and boiled, it can be used as a sudorific in many complaints, and as a substitute for guiacum. An empyreumatic oil, obtained from box-wood chips, is used for relief of toothache and for other medicinal purposes. —Spain and Portugal send into the market large quantities of box-wood; also Circassia and Georgia, from which countries it finds its way to Odessa, and is again exported thence. In 1815, as many box-trees were cut down at Box hill, in Surrey, as brought upwards of £10,000, but the tree is of so very slow growth, that it is seldom planted in Britain except for ornament.—The MINORCA BOX, or BALEARIC BOX (*B. Balearica*), a native of Minorca, Sardinia, Corsica, Turkey, etc., is a larger tree than the common B., and has leaves three times as large. It is much less patient of frost, but is occasionally seen in shrubberies in the s. of England. The wood is of a bright yellow, and inferior

to the true box-wood, but is brought in large quantities from Constantinople under that name for wood-engraving.

BOX-DAYS. These are two days appointed by the judges of the court of session in Scotland, in the spring and autumn vacations, and one day in the Christmas recess, on which pleadings or other law-papers appointed by the court, or by one of the judges, towards the close of the preceding session, may be lodged or filed; the object being to expedite the procedure, notwithstanding the vacation or recess. These days are called box-days, in consequence of an act of sederunt or order of the court of session, dated the 29th Nov., 1690, in which the evil custom of private solicitation of the judges is complained of: "For preventing whereof," says the order, "and for easeing the leidges, themselves, and the lawyers, they, according to the example of the most famous judicatories abroad, have appointed *boxes* for every one of the lords, to stand on a bank in the session-house from three o'clock till seven o'clock at night, each box having a slitt, in which the informations or bills may be lett in, and cannot be drawn out, untill the box be opened; the key whereof is to be keept by every judge himself, and to be committed to no other; and each lord is to send for his box at seven o'clock at night, that he may have competent time to peruse all the informations therein, and to consider the same, and the citationes alleged in the same, whereby none of the leidges can be put to trouble to attend any of the lords for giveing their informationes, bills, or answers." Further facilities for legal business in vacation-time are afforded in Scotland by the regulations of the *bill-chamber* (q.v.); and in England the equity and common-law judges attend at chambers during vacation; but to English lawyers the use of boxes, or of any similar expedient, is unknown. See COURT OF SESSION and other COURTS.

BOX ELDER, or ASH-LEAVED MAPLE, *Negundo aceroides*, a small and handsome tree growing along the banks of streams in the middle and southern Atlantic states, and in the west. Sugar is made from it in some of the n.w. states.

BOX ELDER, co. in n.w. Utah, adjoining Nevada; about 6000 sq. m.; pop. '70, 4855. Great Salt lake covers the s.e. portion of the co., and the Central Pacific railroad passes through it. Productions, agricultural. Co. seat, Brigham City.

BOX-HAULING is a particular mode of turning a ship, when the swell of the sea renders tacking impossible, or when the ship is too near the shore to allow room for veering. The operation is effected by a peculiar management of the helm and the sails. *Boxing-off* is an operation very similar to box-hauling. See further under TACK, VEER.

BOXING, or PUGILISM (Lat. *pugilatus*), fighting with the fists. It was practiced as a manly exercise by the ancients, among whom it was an art so highly esteemed, that Pollux, Hercules, and some of the other gods were represented as having excelled in it. The pugilists of the ancient games had leather thongs on their hands, sometimes loaded with lead or iron; this armature of the hand was called the *cæstus*. Of course, their combats ware not unfrequently attended with fatal consequences, which have resulted also in many instances of modern pugilistic encounters, although no armature of the fists is allowed. Among the Greeks, the practice of B. was at first permitted only to freemen, no slave, or person attainted with crime, being considered worthy to possess the high privilege of being beaten to the consistency of a jelly. Gradually, however, B. was taken up as a profession, and its character deteriorated. B. was a favorite amusement of Englishmen for centuries; it is even said to have had such distinguished patrons as king Alfred and Richard III. But the golden age of pugilism as a profession in England commenced with the accession of the House of Hanover; then men calling themselves professors publicly announced their intention of giving lessons in "the noble art of self-defense." One professor challenged another to combat in the most bombastic language. In 1726, one Ned Sutton, who announces himself as "pipemaker from Gravesend, and professor of the noble science of defense," sneers at another professor, whom he calls "the extolled Mr. Figg," for having by "sleeveless pretense" shirked a combat with him, "which I take," says the pipemaker and professor, "to be occasioned through fear of his having that glory eclipsed by me, wherewith the eyes of all spectators have been so much dazzled." He further assures the said Figg, that if he can muster courage enough to fight with him, he (Figg) "will have the advantage of being overcome by a hero indeed!" Figg had an "amphitheater" in Oxford road, wherein fights were held; and a larger one was erected in the same locality in 1742 for one Broughton, the funds being subscribed by some eighty noblemen and gentlemen. The pugilistic encounters that took place here were patronized by many of the nobility. Some faint protests against the brutality of the pastime now began to be made by the press, but these had little effect. Towards the end of the last century, fights were patronized by princes of the blood-royal; and the prince of Wales, afterwards George IV., was present at one at Brighton, in which one of the combatants was killed. When the allied sovereigns and their generals came over to England in 1814, lord Lowther treated them to a series of boxing-matches in his drawing-room, which were so highly relished that they were repeated a few days afterwards. One of the pugilists, called Jackson, became quite a hero, and made enormous sums by giving lessons to young noblemen, among whom was lord Byron. In 1817, the czar Nicholas of Russia witnessed a prize-fight at Coombe Warren. At the close, the victor was presented to him, with whom he shook hands. This was the last time that royalty was present at one of these disgusting spectacles.

The character of the prize-ring, or, as it is called in the slang of its supporters, "the P. R.," had been for many years declining. People of influence and respectability seemed to have withdrawn their countenance from it. The lowest and least reputable class of the population furnished the fighters, and money was the only object of their backers. "Fair-play" was no longer "a jewel" in the P. R.; fights were sold, and the meanest and most disgraceful tricks resorted to, in order to win or to avoid the payment of bets. Prize-fights were under the ban of the law; in many counties of England, the police actively interfered to prevent them; and some railway companies refused to convey those taking part in them along their lines. The year 1860, however, witnessed a strange revival of the pugilistic spirit, on occasion of a fight between Tom Sayers, the "champion prize-fighter of England," and John Heenan, the "Benicia boy," an American, for £200 a side, and the belt, a badge of honor worn by the champion. The battle, which was elevated to the dignity of "a great international contest" by sporting papers, took place at Farnborough, April 17, 1860. It lasted for more than two hours, in which time the American was beaten almost blind, and the Englishman dreadfully bruised. The continuance of the battle was prevented by the breaking in of the ring, caused by the interference of the police. After the fight, the English champion was ranked by many newspapers—not sporting ones—with the heroes of the Crimea and of Lucknow; hundreds, if indeed not thousands, of pounds were subscribed for him, in admiration of his bravery, by persons of all conditions of life, and residing in all parts of the country; and he was fêted by merchants on the London and Liverpool 'changes. His opponent received equally flattering and substantial testimonials from Americans. The fight formed the subject of discussion in the house of commons, in which the home secretary announced that not only the principals, but all present at the spectacle, were amenable to the law. Though no steps were taken to bring the offenders to justice, it was intimated to those chiefly concerned, that if a renewal of the fight were attempted, the law should be put in force against those aiding or abetting it.

The training which prize-fighters undergo for some months before a battle is of the most healthful kind; it rids them of every superfluous grain of flesh, braces their nerves, and makes their muscles like iron; yet, owing to the rude way in which the result of all this training is demolished in an hour's fight, professional boxers are usually very short-lived. With the exception of one, Gulley, who became M. P. for Pontefract, and the Jackson already alluded to, who made a fortune, few of them have ever risen to anything above the ownership of a low public-house, where they lay down the law on pugilism to their admirers, and take the chair at so-called "harmonic meetings," where B. is the entertainment. Prior to the decline of B. the doings of the prize-ring were duly chronicled by sporting papers. The following specimens of the slang will afford a sufficient idea of the character of this kind of literature. The mouth is called the "potato-trap," the "kisser," the "whistler," the "grubber," and the "oration-trap;" the nose is variously described as the "claret-jug," the "smeller," the "sneezer," the "snorer," the "sniffer," the "proboscis," the "nozzle," the "snout," the "scent-bottle," and the "snuff-box;" the ear as the "conk;" and the eyes as the "daylights," the "peepers," the "squinters," the "goggles," etc. Instead of saying that the eyes did not swell up, the *littérateurs* of the P. R. would say that the boxer "did not seem inclined to adopt the early-closing movement with either shutter!"

BOXING-DAY, the day after Christmas, and so called in England from being the day on which *Christmas boxes*, or presents, are given to servants and others. See CHRISTMAS Box.

BOXING THE COMPASS is one among many sea-phrases not easily traceable to their origin. It means simply a rehearsal or enumeration of the several points, half-points, and quarter-points of the mariner s compass, in their proper order; and is among the lessons which a young sailor has to learn.

BOX'TEL, a busy t. in the Netherlands province of North Brabant, is 6 m. s. of Bois-le-Duc. Pop., Jan. 1, '75, 5034, who are employed in agriculture and in manufactures. B. is famed for its table-linens, and beer, leather, paper, and salt are extensively made. It has connection with the leading railways. The Anglo-Dutch army, under the command of the duke of York, was here defeated with great loss by the French in 1794.

BOX-THORN, *Lycium*, a genus of plants of the natural order *solanaceæ*, having funnel-shaped or tubular flowers, and 2-celled berries. The species are pretty numerous, and found in different quarters of the world. Several are natives of the s. of Europe, thorny shrubs, with long slender shoots and simple lanceolate leaves. *L. Europæum* may be trained to a height of 30 or 40 ft., and is often planted—as are also other species—for ornament, to cover walls, etc. It has pale-violet-colored flowers, reticulated with red veins. Some of the species are almost trees. *L. fuchsioides*, although destitute of spines, is used as a hedge-plant in its native country, the Andes of Quito. Its flowers are orange scarlet, and grow in umbels.

BOX-TORTOISE, or LOCK-TORTOISE, *cistudo Virginica*, and *cistudo Blandingi*, characterized by the division of the shell into two parts in such a way that the animal can shut himself entirely into the shell. They have longer legs and run faster than other tortoises, but are harmless and very timid.

BOYA'CA, one of the states of Colombia bordering upon Venezuela and its fellow states of Santander and Cundinamarca; 33,351 sq.m.; pop. '71, 482,874. In the western part of the state is a branch of the Andes, from which the land slopes east in vast prairies, covered to a great extent with marshes and forests, with here and there pastures and cultivated ground, watered by the Orinoco and the Meta. The lowlands are fertile, yielding tropical fruits, sugar, cotton, cacao, tobacco, dyes, drug-stuffs, and timber. In the southern part of the state are many hot springs, the vapors from which in dry weather condense and cover the surrounding country with sulphate of soda, and this is gathered and sold in other sections as a substitute for salt for cattle. There are springs near the capital which are hot by night and cold by day. The climate of the plain is hot and unhealthy; in the valleys it is better, and in the high regions cool. The people have rude manufactures of cotton, wool, straw, etc.; but cattle-raising is the chief business. Gold, lead, and precious stones are found, but not to a great extent. The forests are infested with dangerous wild animals, serpents, and venomous insects. Capital, Tunja, where the Zaques kings once reigned.

BOYA'CA, a t. of the United States of Colombia, near which, in 1819, Bolivar, by a victory over the Spaniards, secured the independence of Colombia. It gives its name to the department, which stretches from the plateau of Bogota to the borders of Venezuela, being watered by the Magdalena, Sogamozo, Zulia, Cazanare, and Meta. The capital, however, is not B. itself, but the neighboring city of Tunja, which is about 70 m. to the n.n.e. of Bogota.

BOYAR. See BOJAR.

BOY'AU, in military engineering, is a winding or serpentine trench, dug to form a path or communication between the different armed trenches of a siege-work, and to prevent them from being enfiladed, or fired upon in flank.

BOY-BISHOP. The custom of electing a boy-bishop on St. Nicholas's day dates from a very early period. Warton thought he could find some allusion to it in one of the anathemas of the Constantinopolitan synod, 867 A.D. It quickly spread over most Catholic countries, and in England seems to have prevailed in almost every parish. Although the election took place on St. Nicholas's day (6th Dec.), the authority lasted to Holy Innocents' day (28th Dec.). The boy-bishop was chosen from the children of the church or cathedral choir, or from the pupils at the grammar-school. He was arrayed in episcopal vestments, and, attended by a crowd of subordinates in priestly dress, went about with songs and dances from house to house, blessing the people, who, as bishop Hall says, "stood grinning in the way to expect that ridiculous benediction." The boy-bishop exacted implicit obedience from his fellows, who, along with their superior, took possession of the church, and performed all the ceremonies and offices except mass. The custom found countenance not among the populace only. In 1299, Edward I., on his way to Scotland, permitted a boy-bishop to say vespers before him at Heton, near Newcastle-on-Tyne, and gave him and his companions a present. At Salisbury—and perhaps in other places also—the boy-bishop, it is said, had the power of disposing of such prebends as happened to fall vacant during the days of his episcopacy; and if he died during his office, the funeral honors of a bishop, with a monument, were granted him. What secular shows and entertainments accompanied this practice, history does not inform us. Probably dramatic exhibitions of a rude nature were the principal. In England, the custom of electing a boy-bishop was abolished by a proclamation of Henry VIII., dated July 22, 1542; restored by queen Mary in 1554; and again abolished during the reign of Elizabeth, though it seems to have lingered here and there in villages till about the close of her reign.

BOYCE, WILLIAM, 1710–79, an English musician, the son of a mechanic, who became an organist and conductor of the royal orchestra. His compositions are mainly church-music, and many of them are still in use. He was the author of two musical dramas, *The Chaplet* and *The Shepherd's Lottery.*

BOYD, a co. in n.e. Kentucky, on the Ohio and Big Sandy rivers; intersected by the Lexington and Big Sandy railroad; 230 sq.m.; pop. '80, 12,165—557 colored. It has a hilly surface, with plenty of hard coal and iron ore. Productions agricultural. Co. seat, Catlettsburg.

BOYD, ANDREW KENNEDY HUTCHISON, D.D., b. Ayrshire), 1825; a Scotch preacher and writer, educated at Glasgow university; a member of the established church, stationed at St. Andrews. He is the author of *Leisure Hours in Town; Gracer Thoughts of a Country Parson; Present Day Thoughts,* and other popular works.

BOYD, JOHN PARKER, 1768–1830; an American soldier, native of Massachusetts, who went to India, where he raised a little army of 500 men (a few of the officers being English), with arms, elephants, etc., which he let to such native princes as chose to hire their services, impartially preferring the highest offer. The trade grew dull, and in 1808 he sold his army and came home, fought as a colonel in the battle of Tippecanoe, and became brig. gen. in 1813. He published some documents relating to the war of 1812.

BOYD, ZACHARY, an eminent Scottish divine, born before 1590, was educated at Kilmarnock, and studied at the universities of Glasgow, and Saumur in France, of which latter he was, in 1611, appointed a regent or professor, and is said to have declined the

principalship. The persecutions of the Protestants in France caused him to return to Scotland in 1621. In 1623, he became minister of the Barony parish, Glasgow, and was thrice elected rector of the university of that place. His principal prose work, *The Last Battell of the Soule in Death*, published at Edinburgh in 1629, in 2 vols., was reprinted, with a life of the author, by Gabriel Neil, Glasgow, 1831. He was author of eighteen other works, chiefly of a religious cast. The third edition of his *Psalmes of David in Meeter* appeared at Glasgow, 1646. He died in 1653 or 1654, leaving numerous MSS., and his library, with a considerable legacy, to the college of Glasgow, over a court gateway of which is his stone bust, whilst his portrait is in the divinity hall of the same university. Among his MSS. is a collection of quaint poems on Scriptural subjects, entitled *Zion's Flowers*, usually called Zachary Boyd's Bible. As a specimen of his homely style, the following extract from Jonah's soliloquy within the whale's belly may be quoted here:

What house is this, where's neither coal nor candle,
Where I nothing but guts of fishes handle?
I and my table are both here within,
Where day neere dawned, where sunne did never shine;
The like of this on earth man never saw,
A living man within a monster's maw,
Buried under mountains which are high and steep,
Plunged under waters hundreth fathoms deep.
Not so was Noah in his house of tree,
For through a window he the light did see;
He sailed above the highest waves—a wonder;
I and my boat are all the waters under;
Hee in his arke might goe and also come,
But I sit still in such a straitened roome
As is most uncouthe, head and feet together,
Among such grease as would a thousand smother.
I find no way now for my shrinking hence
But heere to lie, and die for mine offence.
Eight prisoners were in Noah's hulk together;
Comfortable they were, each one to other.
In all the earth like unto me is none,
Far from all living, I heere lye alone.

BOYDELL, JOHN, a liberal patron of art in England, b. in 1719. At the age of 21, he apprenticed himself for seven years to an engraver in London, and on the expiration of his apprenticeship, published, by subscription, a series of views in England and Wales, with the profits of which he set up a print-selling business in the metropolis. English engraving was at a low ebb when B. threw his money and intelligent energy into the work of its improvement. Under B.'s liberal patronage of native artists, the importation of foreign prints, for the most part, not only ceased, but English prints were exported to the continent. B. now determined to do for English painting what he had done for engraving. He accordingly selected Shakespeare's works for illustration; and in the carrying out of his object, secured the most eminent painters in the kingdom, including Opie, Reynolds, Northcote, and West. The result was the magnificent "Shakespeare Gallery," from which was engraved a superb volume of plates (Lond., Boydell, 1803). B. also published, at Bulmer's press, a splendid edition of Shakespeare's works in 9 vols. (1792–1801). The immense sums of money he spent on the Shakespeare illustrations, and the commercial depression consequent on the French revolution, brought him into difficulties, from which he was not wholly extricated before his death, in Dec., 1804. An alphabetical catalogue of plates containing engravings by the best artists, from the finest works of the Italian, Flemish, German, French, and English schools; sketches from Claude Lorraine, etc., were among the collections published by Boydell.

BOYDEN, SETH, 1785–1870; b. Massachusetts; an American inventor; began making patent leather in 1819; invented a machine for splitting leather, and a process for making spelter. In 1826, he made the first malleable cast-iron. Among other inventions was one for making hat-bodies, and a process for making Russia sheet-iron. He built the first successful locomotive that had the cylinders outside of the frame.

BOYER, ALEXIS, Baron de, a French surgeon of the greatest eminence, was b. at Uzerche, in Limousin, on 30th Mar., 1757, or, according to others, in 1760. He was for some years in the service of a notary, before he began his medical studies. In 1787, he was appointed second surgeon to the hôspital de la charité at Paris, and afterwards professor, first of operative surgery, and then of clinical surgery, at the École de Santé. In 1804, he was appointed first surgeon to the emperor, who also raised him to the rank of baron. He accompanied the emperor on his campaigns and journeys. After the restoration, B. became professor of practical surgery in the university of Paris, and first surgeon at the hôspital de la charité. In 1823, he was appointed consulting surgeon to the king; and in 1825, was admitted a member of the institute. He died on 25th Nov., 1833. His greatest works are his *Traité Complet d'Anatomie*, 4 vols. (Par. 1797–99. and other editions), and his *Traité des Maladies Chirurgicales et des Opérations qui leur conviennent*, 8 vols. (Par. 1814–22). From 1798 to 1817, he was engaged with Roux and Corvisart in conducting the *Journal de Médicine Chirurgie et Pharmacie*.

BOYER, JEAN BAPTISTE NICHOLAS, a French physician, 1693–1768. He devoted his life to the investigation and treatment of contagious diseases, and with much success.

The courage and ability which he displayed during the plague in Marseilles procured him a pension and the place of physician in ordinary to the king. His best known works are *Account of the Plague at Marseilles in* 1720, and *Observations on the Epidemic that prevailed at Beauvais.*

BOYER, JEAN PIERRE, a mulatto, president of the republic of Hayti, was born 2d Feb., 1776, at Port-au-Prince, capital of that part of the island then belonging to France. At a very early age he was sent to France, where he received a European education; and in 1792, entered the military service. He very soon became a *chef de bataillon*, and fought against the British on their invasion of his native isle. After further fighting against the British under gen. Rigaud, leader of the mulattoes, and afterwards under gen. Leclerc, he entered into a combination which had for its object the union of the negroes and mulattoes, and a complete emancipation of the colony. After the negro Dessalines had seated himself upon the throne, B., along with Péthion, took the lead of the colored people. They assisted Christophe to overthrow the bloody tyrant in 1806, but deserted Christophe when they saw that he wished to make himself sovereign. Péthion now established an independent republic in the western part of the island; and B. made himself indispensable to him by his military and administrative knowledge, so that he was invested by the new president with the command of the capital, Port-au-Prince, and the rank of a maj. gen. In this capacity he endeavored to discipline his troops after the European manner; drove back more than once the black hordes of Christophe, thereby preserving Port-au-Prince from destruction; was recommended to the people by Péthion, when dying, as most worthy to be his successor; and was unanimously elected president of the republic. He arranged the financial affairs, collected funds into the treasury, improved the administration, and encouraged arts and sciences. After the death of Christophe, he united the monarchical part of the island with the republic in 1820; and in 1821, the eastern district also, which had hitherto remained under the dominion of Spain; and he urgently sought the recognition of the independence of the youthful state by France, which was obtained in 1825, upon payment of an indemnity of 150 millions of francs. B. carried on the government of the republic of Hayti for fifteen years, from this time, with the most perfect peace; but his policy, which was rather arbitrary, and directed to the object of depressing the negroes in favor of his own race, the colored people, resulted in a victorious insurrection in 1843. B. fled to Jamaica, whence he announced his resignation to the Haytian revolutionary committee, and condemned himself to a voluntary ostracism. From the proclamation of the provisional government, it appeared that he was the victim of his aristocratic policy; but the provisional government, after it had obtained the upper hand, conducted itself very moderately towards the defeated party. See HAYTI. After a protracted stay in Jamaica, B. went to Paris, where he died in the beginning of July, 1850. He was a man of great perseverance, and of captivating manners, but artful, and often harsh and cruel to those under him.

BOYLE, a co. in central Kentucky; 180 sq.m.; pop.'80, 11,930—4,738 colored. The Louisville and Nashville railroad passes through the county. The soil is deep and fertile, producing cereals and root crops. Co. seat, Danville.

BOYLE, a t. in Roscommon co., in a picturesque valley on both sides of the Boyle, 1 m. above its expansion into lough Key, and 8 m. n.w. of Carrick-on-Shannon. Pop. '71, 3347. It has a large trade in corn and butter. Latin and English annals of B. date from 420 to 1245, and have been published. An abbey was built here in the 12th c., and was reduced to its present ruined state in 1595 by the earl of Tyrone.

BOYLE, CHARLES, third Earl of Orrery, was b. at Chelsea, Aug., 1676, and entered Christ Church, Oxford, in his 15th year, where he had for his tutors Drs. Atterbury and Friend. His attainments as an undergraduate were respectable for a nobleman, and probably this circumstance induced the master of the college, Dr. Aldrich, to select the youth for the annual task of editing a classic. In B.'s case, it unfortunately happened that the *Epistles of Phalaris* were chosen, sir William Temple having about that time passed the most extravagant encomiums upon them. In 1695 the work appeared. Two years later Bentley published his famous *Dissertation*, in which he proved that the Epistles, instead of being composed in the 6th c. B.C., were the production of the 2d c. after Christ. B., in reality, had little to do with the unlucky performance to which his name had been attached. It was the work chiefly of Atterbury and Friend. Nevertheless, in the following year, and while B. himself was absent from the country, the wits and scholars of Christ Church again exposed him and themselves to the merciless criticism of Bentley, by publishing *An Examination of the Dissertation, etc., by the Hon. Charles Boyle.* In 1699, Bentley once more replied, and sealed the lips of his adversaries forever. But for this *Battle of the Books*, in which he only seemed to be engaged, B.'s name would have been forgotten. In honor of him, the name of "Orrery" was given to the scientific apparatus of that name by its constructor, to whom B. had been kind. He fought as a maj.gen. at Malplaquet, was promoted to diplomatic and court appointments, wrote some literary pieces, and died in 1731. Of his poems, even sir Richard Blackmore said:

> After his foolish rhymes, both friends and foes
> Conclude they know *who did not write his prose.*

BOYLE, JOHN, Earl of Cork and Orrery. He was educated at Oxford, and devoted himself to literature, translating the letters of Pliny the younger, and writing a life of Swift in letters to his son. He published also the *Memoirs of Roland Carey, Earl of Monmouth*, and his own letters from Italy were published after his death.

BOYLE, RICHARD, the founder of the house of Cork and Orrery, and fitly styled the great earl of Cork, was b. in 1566, at Canterbury, of a good but not wealthy family. At the age of 22, after having studied at Cambridge and the middle temple, he went over to Ireland with a few pounds in his pocket, to hew his way to fortune. His energy, prudence, and signal capacity for government, received their reward. He bought estates and improved them, promoting the immigration of English Protestants, and triumphed over the envy of his enemies, making good his cause before queen Elizabeth, and winning her favor. Due honors flowed in upon him, and at length he was knighted. In 1620, he became viscount Dungarvan and earl of Cork. In 1631, he was made lord high treasurer, an office which remained hereditary in his family. In his old age, the Munster rebels compelled him to gird on armor and turn his castle into a fortress. He soon raised a little army of his servants and tenants, and with an auxiliary force commanded by his four sons (and paid, when his money was spent, out of his plate-chest), the noble old earl took castles, smote the rebels, and quenched rebellion in his borders. He died in 1644 at the age of 78.

BOYLE, the Hon. ROBERT, seventh son and fourteenth child of the first earl of Cork, was b. at Lismore, Waterford, Jan. 25, 1626. As a child, he was distinguished by precocity of intellect and a rare love of truth. After studying at Eton and at home, he went to the continent, where he stayed for six years. On his return in 1644, he found himself in possession, by his father's death, of the manor of Stalbridge, Dorsetshire, where he took up his abode and resided till 1650. He took no part in political strife, but devoted himself to the cultivation of science, and particularly of chemistry and natural philosophy. He was one of the first members of that association of scientific men which about that time, 1645, held private meetings at Oxford and London, and some years after became better known as the royal society. In 1654 he settled at Oxford. Here he experimented extensively in pneumatics, and improved the air-pump. At the same time, he devoted considerable study to theology. After the restoration, he was urgently advised by lord Clarendon to enter the church, but he thought that he could do better service to religion as a layman. Among the proofs which he gave of this, besides his own theological writings and eminent example, were his exertions as a director of the East India company for the propagation of Christianity in the east, as well as in procuring and circulating at his own expense translations of the Scriptures, and his bequest for the foundation of the "Boyle Lectures" (q.v.) in defense of Christianity. In 1668, he took up his residence permanently in London, and was thenceforth able to devote much of his time to the business of the royal society. In 1680 he was chosen president, but declined the honor. A peerage had repeatedly been offered to him, and declined. In 1688, finding his health decline, he shut himself up against all interruption, in order to husband his remaining time for the labor of repairing the loss caused by the accidental destruction of his MSS. In 1691, his health finally gave way, and on the 30th of Dec., 1692, he died, seven days after his beloved sister, lady Ranelagh. B. was tall and emaciated in person, and extremely temperate in his habits, often subject to low spirits, but naturally lively and of rare conversational powers. His piety, benevolence, and charity would have made him remarkable, apart from his scientific attainments and reputation. His complete works (including his very interesting correspondence), with a life by Dr. Birch, and an index, were published in 5 vols. fol. (Lond. 1744).

BOYLE, ROGER, Earl of Orrery, fifth son of the "great earl of Cork," 1621–79. He was made baron Broghill when only five years old; studied at Dublin college, traveled in France and Italy, and married Margaret Howard, sister of the earl of Suffolk. There was a rebellion spreading in Ireland, and B. started to get from Charles II. a commission to raise troops. At London he was confronted by Cromwell, then gen. of the parliamentary forces and one of the committee of state, who told him that the committee knew of his design, but B. declared the information false. Cromwell then produced B.'s private correspondence, and he was compelled to admit, and ask pardon, whereupon Cromwell offered him a command as general officer, exempt from all oaths and engagements, and added that he should not be compelled to draw his sword against any save Irish rebels. Thenceforth B. served the protector honorably and with effect, and Cromwell placed high confidence in him, making him one of his privy council. When the restoration came, it was found that B. had done much towards it, and the king made him earl of Orrery, and soon after one of the lords-justices of Ireland. In 1665, he went to England to settle a serious misunderstanding between Charles and the duke of York, and on his return he rendered abortive a scheme of the French and Dutch for a descent upon Ireland. He wrote several dramas and poems which have long been forgotten.

BOYLE LECTURES, so called from the founder, the honorable Robert Boyle (q.v.), who settled an annual salary, charged upon his dwelling-house in St. Michael's, Crooked lane, London, for "some preaching minister," who shall preach eight sermons in the year for proving the Christian religion against atheists, deists, pagans, Jews, and Mohammedans, not descending to any controversies among Christians themselves.

Archbishop Tennison procured a yearly salary of £50, to be charged upon a farm at Brill, Bucks, instead of the original charge for the endowment. The office is tenable for three years.

The first series of lectures, *A Confutation of Atheism*, was preached in 1692 by Richard Bentley (q.v.). In 1704, Dr. Samuel Clarke preached the lectures, entitled *A Demonstration of the Being and Attributes of God*, in answer to the arguments of Hobbes, Spinoza, and their followers. In 1709, Dr. Lilly Butler lectured on *Religion no Matter of Shame*. All the lectures preached up to 1732 were collected into a fine folio edition, in 3 vols. (Lond. 1739); since that period, till recently, few of the lectures have been published. In 1846, the course of lectures was preached by the Rev. F. D. Maurice, and published under the title, *The Religions of the World*. The more eminent lecturers of recent years whose courses have been published are: Merivale, the historian (1864–65), who lectured on *The Conversion of the Roman Empire and Northern Nations;* prof. Plumptre (1866); prof. Stanley Leathes (1868–70); and Dr. Hessey (1871–73).

BOYLE'S FUMING LIQUOR is the term applied to a concentrated solution of ammonia, saturated by a stream of hydrosulphuric acid, which combining with it, forms the sulphide of ammonium (NH_4S). Exposed to the air, it fumes, and evolves a very disagreeable odor, resembling, but in an intensified degree, ordinary bilge or sewerage water.

BOYLE'S LAW. See MARIOTTE'S LAW, *ante*.

BOYLSTON, ZABDIEL, 1680–1766; b. in Mass. When inoculation in cases of smallpox was first called to public attention in this country, B. was the earliest experimenter, all the other physicians rejecting the new notion. He tried it in his own family, and then among others; but the whole profession opposed him, and he came near being mobbed. Finally a number of eminent ministers came to the rescue, and he and inoculation were supported.

BOYNE, a river in the e. of Ireland, rises in the bog of Allen, and flows through Kildare, King's co., Meath, and Louth. It passes Trim, Navan, Slane, and Drogheda, and enters the Irish sea 4 m. below the last town, after a course of 65 m. in a carboniferous limestone basin, its total descent being 336 feet. Its chief tributaries are the Deel, Mattoch, and Blackwater. It is navigable for vessels of 250 tons to Drogheda, and for barges of 70 tons to Navan, 19 m. up. Its banks are studded with many ruins of monasteries and castles. In 838, Turgesius the Dane sailed up the B., and plundered Meath. But this river is chiefly famous for the battle of the Boyne, which took place on its banks, near Oldridge, on the 1st of July, 1690, and in which William III. defeated James II. An obelisk, 150 ft. high, marks the scene of the battle.

BOYNE, BATTLE OF THE, in Ireland, near the river Boyne, July 1, 1690 (in new style the 12th of July is the anniversary). This battle was fatal to the cause of James II., and assured the ascendency of Protestantism in England. The troops of James, 30,000 in number, were defeated with a loss of 1500, by the forces of William III. (James' son-in-law), who had about the same number of men, but lost only about 500. James fled to Dublin, thence to Waterford, and escaped to France. The duke of Schomberg, the leader of a contingent of French Protestants, while leading his troops across the river, was accidentally shot by one of his own men. In the same battle rev. George Walker, the Protestant leader who so long defended Londonderry, was killed. The battle is sadly remembered now, nearly 200 years after its occurrence, by all Irish Roman Catholics, and on the other hand is joyfully celebrated by Protestants of that nation, who parade on each anniversary, wearing orange colors in allusion to William III., prince of Orange. Even within a few years past the 12th of July has been marked in several American, Canadian, and Irish towns by deeds of violence arising from religious animosity. In New York, in response to the request of the authorities, the Orangemen have ceased their public parades, but celebrate the day by excursions, picnics, or in some other private manner.

BOYS, SHIPS'. In nautical language, all the young or green hands on board are called *boys*, without much reference to their age; but in recent times, arrangements have been made to give a more precise meaning to the term, by engaging boys or lads as part of the crew.

In the royal navy, boys were first voted for in the estimates in 1834. There were 1000 in that year; 7000 in 1876; 6300 in 1878; and 5300 in 1879. The admiralty has, in recent years, made many regulations for attracting boys into the navy. Most of the seamen at present in the service entered it as boys. They enter mostly at about 14 years of age, but some as late as 18, and they are bound for 7 years. There are schools established for them at Portsmouth, Plymouth, Cork, and one or two other places. The boys are ranked in two classes, according to age and experience. When out of their time, they have a tendency to enter the merchant service for two or three years; but they usually return to the navy, and enter as ordinary seamen. See further under MANNING THE NAVY.

In the merchant service, boys are apprenticed to the shipowners; they learn their duties by degrees; and constitute the source out of which mates, masters, and captains are ultimately supplied. By the merchant seamen's act of 1844, every merchant-ship was bound to take a certain number of boys as apprentices, according to tonnage; the

better hands were apprenticed by their friends; the worst were picked up by the marine society from the poor and wretched of the streets, and apprenticed as a means of setting them up in life. The indenture was from 12 to 18 months. The regulations have been modified in form, but not in substance, by the mercantile marine act of later date.

BOYSE, or BOIS, JOHN; one of the translators of the English Bible, 1560–1643. He could read Hebrew when only five years of age. At Cambridge he paid especial attention to Greek, and lectured on that language for ten years. While rector of Boxworth he was selected as one of the translators, and it is said did not only his own portion, but also that of another translator.

BOZRAH, or BOSTRA; the name of one or two places mentioned in the Bible—a city of Edom, and a city of Moab. The general opinion is that B. was on or near the present village of el-Buseirah, 25 m. s.e. of the Dead sea. B. is now a small village, with a strong fortress on the top of a hill, in a pastoral district, and inhabited by between 100 and 200 shepherds. The Moabite Bozrah is a vast collection of ruins, about 80 m. s. of Damascus. In 105 A.D., the city was restored and beautified by Trajan, who made it the capital of the province of Arabia. In the reign of Alexander Severus it was made a colony, and in 245 A.D., Philippus, a native of B., ascended the imperial throne. It appears to have been Christianized by Constantine, and was the see of an extensive bishopric. B. was one of the first Syrian cities subjected to the Mohammedans, and was held by them against all attempts of the crusaders at recapture. As late as the 14th c. it was a populous place.

BOZZARIS, MARCOS, a Greek patriot who distinguished himself in the early part of the modern war of independence, was b. at Suli, in the mountains of Epirus, towards the close of the 18th century. His youth was spent amid the din of arms. In 1803, he was forced to retreat to the Ionian isles by Ali Pasha (q.v.), who, in a series of bloody combats, had nearly exterminated the Suliotes. In 1820 two events occurred which called forth his patriotic energies: Hypsilanti summoned the Greeks to insurrection, and war broke out between Ali Pasha and the sultan. On learning the news, B. put himself at the head of some 800 expatriated Suliotes, and passed over into Epirus. Ali, who dexterously endeavored to identify his cause with that of the Greeks, soon found means to secure B.'s services against their common enemy, the sultan. B. obtained several victories, and on the death of Ali at the taking of Janina in 1822, he continued the war successfully against Khurshid Pasha, the Turkish general. Shortly after, prince Mavrocordato landed at Mesolonghi, with a body of disciplined troops, and being joined by B., he engaged the Turks at Petta, on the 16th of July, 1822. Through treachery the Greeks were overpowered, their best soldiers perished, and B., along with Mavrocordato, was compelled to retire to Mesolonghi. This place he skillfully defended against the Turks, until a Hydriote fleet forced them to retire. In the summer of 1823, a Turco-Albanian army of 20,000 men, under the command of the Pasha of Scodra, descended from the n. of Epirus. B., who knew that the fortifications of Mesolonghi were too weak to withstand an assault, determined to surprise his enemies by a sudden blow. He advanced swiftly at the head of 1200 men, and on the 20th of August reached Kerpenisi, where the van of the Turco-Albanian army, 4000 strong, was encamped. At night, the Suliotes burst in upon their startled foes, who were routed with great slaughter. The victors captured their camp, standards, and a vast quantity of baggage. This triumph was saddened by the loss of the heroic B., who fell while leading on his men to the final attack. His body was solemnly interred at Mesolonghi, and he was honored with the title of the "Leonidas of Modern Greece."

BOZZOLO, a t. of n. Italy, province of Mantua, situated on the right bank of the Oglio, about 16 m.w.s.w. of Mantua. B., which was at one time a small independent republic, has remains of old fortifications, some silk-weaving, and an annual fair. Pop. about 4500.

BRA, a t. in the province of Cuneo, n. Italy, 25 m. n.e. of Coni. It has metal foundries and silk manufactures, and a good trade in cattle, grain, and wine. Pop. 10,500.

BRABANCONNE, the patriotic song of the Belgians, originally sung by the insurgents during the revolution of Sept., 1830. A young French player, by name Jenneval, at that time connected with the theater at Brussels, was the author of the song; it was set to music by a singer named Campenhout. Jenneval fell in a combat with the Dutch at Berchem. The Belgians allowed his mother a pension of 2400 francs. Campenhout received from king Leopold a golden snuff-box, and was appointed director of the royal chapel. Each verse of the B. ends with the refrain—

La mitraille a brisé l'orange
Sur l'arbre de la liberté.

BRABANCONS, mercenary fighters from Brabant and other countries who, in the later middle ages, served any who would pay them. They were poorly organized and little better than banditti.

BRABANT was the name formerly given to an important province of the Low Countries, extending from the left bank of the Waal to the sources of the Dyle, and from the Maas and the plain of Limburg to the lower Scheldt. In the time of Cæsar,

B. was inhabited by a mixed race of Germans and Celts; it afterwards came into possession of the Franks; and in the middle ages it formed a duchy by itself, dependent upon Lower Lorraine, with which, in 1107, the county of Antwerp was incorporated, and in 1347, for a time, the lordship of Mechlin or Malines, formerly connected with Liège. After many changes, B. (divided into the provinces of North and South B.) was made a part of the kingdom of Holland, at the Congress of Vienna; but at the revolution of 1830, South B. separated from Holland, and became part of Belgium (q.v.). Old B. is now divided into three provinces: 1. North or Dutch B., containing 1960 sq. m., and (1875) 447,632 inhabitants; 2. The Belgian province of Antwerp, which contains 1094 sq. m., and (1873) 513,543 inhabitants; and 3. South B., also Belgian, containing 1260 sq. m., and an extremely dense pop. of (1873) 922,468. The country consists of a plain gently sloping to the n.w., and rising in the s. into gentle hills, which are offsets of those of the Ardennes. In the level northern part are many heathy and fenny tracts; one of them, a morass called the Peel, is 20 m. in length, and from 2 to 6 broad. In the hilly district of the s. is the forest of Soignies. The Maas and the Scheldt are the principal rivers; but some of their tributaries are also very useful for internal commerce, which is further promoted by canals and railways. The soil of North Brabant is fertile, and wheat, rye, oats, barley, beans, potatoes, beet, colza, madder, flax, and hay are extensively grown; also hops, tobacco, and chicory. Farm stock is large. Principal towns are: s'Hertogenbosch, Tilburg, Breda, and Bergen-op-zoom. Soap-boiling, distilling gin, book-printing, refining salt, making beet-sugar, beer, cigars, thread, woolen cloths, leather, earthenware, weaving and printing cottons, Turkey-red dyeing, are chief industries. B. lace has long been celebrated. The inhabitants in the n. are Dutch; in the middle district, Flemish; and in the s., of Walloon race. The boundary between the languages is a few leagues to the s. of Brussels, the Walloon French being spoken to the s., and Flemish and Dutch to the n. of this line.

BRACCIO, Fortebracci, Count of Montone, a celebrated condottiere (see Condottieri), born at Perugia in 1368, of an old patrician family, was, in early youth, the leader of a troop of mercenaries in the service of the count of Montefeltro, against the Malatesti, lords of Rimini. He became the champion of the Perugian nobles who were driven into exile in 1393; and after serving in Lombardy under Alberico da Barbiano, he carried on a partisan warfare in the marches of Ancona against the marquis Ludovico Migliorati, nephew of pope Innocent VII. In 1408, he entered the service of Ladislaus, king of Naples, who had designs on central Italy, and, with his condotta, crossed the Apennines, scoured the valley of the Tiber, and took several towns. In June of the same year, the people of Perugia offered the dominion of their city to the Neapolitan king on condition that he would prevent the nobles from returning. He accepted it, and ungenerously sent a large force against B., who retired to the marches. In 1416, however, B. obtained the sovereignty of his native city, when the banished nobles, after an exile of twenty-four years, were restored. In 1417, B. got possession of Rome by capitulation, but was soon obliged to evacuate it. He afterwards made terms with the pope (Martin V.), with whom he had a conference at Florence in Feb., 1420, and subsequently accepted from Joanna, queen of Naples, the command of her land-forces, with the rank of high constable of that kingdom. Entering the Abruzzo, he surprised Capua, and having relieved Naples, then besieged by the queen's enemies, was created by her count of Foggia and prince of Capua. In 1423, B. was, by her order, crowned at Perugia, as prince of Aquila and Capua. Aspiring to the throne of Naples, he overran Campania and Apulia with a considerable army, took Bari, and advanced into Calabria. In a battle which ensued for the relief of the strong town of Aquila, besieged by him, B. was wounded and taken prisoner. After lingering for three days, refusing food, he died June 5, 1424, in his 56th year. His deeds, in chronological order, and those of his contemporary, Piccinino, are commemorated by Lorenzo Spirito, in a poem of 101 chapters, in terza rima, entitled *L'Altro Marte* (Vicenza, 1489).

BRACE, in carpentry, an oblique piece of wood used to bind together the principal timbers of a roof or other wooden structure. See Roof, Boring.

BRACE, Charles Loring, b. Conn., 1826; graduate of Yale; studied in the union theological seminary; a recognized minister, but not in charge of any church. In 1850, in company with Frederick Law Olmstead he made a pedestrian tour in Great Britain; the next year went to Hungary, where he was arrested on suspicion of being one of Kossuth's agents, but was soon released. Afterwards he studied the school systems of Switzerland, England, and other countries. On his return in 1852, he became associated with Rev. Mr. Pease in the early operations of the "New York Children's Aid Society," which made an effort to transport to homes in the country some of the outcast and poor children of the city, and to give instruction and shelter to those who remained. The society at once took favor with the people; B. soon became and still remains the head and soul of it, and its operations have risen to national importance. Through its agency many thousands of unfortunate and neglected children have been made honorable men and women. B. visited Europe again, and the result of his observations is found in *Hungary in* 1851; *Home Life in Germany; Norse Folk; Races of the Old World*, etc. He has also published *The New West; Short Sermons for Newsboys; Dangerous Classes in New York*, etc.

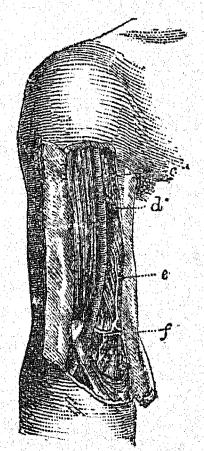
BRACE, JULIA, b. Conn., 1806; at the age of 4½ years she lost both hearing and sight, and quickly forgot the little she had learned of language. When 19 years old she entered the deaf and dumb asylum in Hartford, where she lived about 30 years, and then made her home with a relative, with whom she was living in Dec., 1879. She has a strong memory, and easily discriminates by feeling the articles belonging to different persons. She knows enough about time to reckon days and weeks, and always recognizes Sunday. Though she has not manifested a profound moral consciousness, she does not steal, nor does she commit any wrong act; being regardful of the rights of others, while she is careful also of her own.

BRACELET (Fr. *brachiale*, from Lat. *brachium*, the under part of the arm), an ornament worn on the arm, generally at the wrist. Bracelets and armlets (Lat. *armillæ*) have been used by every nation, both savage and civilized, from the earliest periods to our own. They are frequently mentioned in Genesis, as worn both by men (xxxviii. 18) and by women (xxiv. 30); both by the Hebrews and the surrounding nations (Numb. xxxi. 50). Similar ornaments were worn round the ankles, but they are stigmatized by Isaiah as marks of luxury (iii. 16). The Medes and Persians were remarkable, even amongst Asiatics, for their love for ornaments of this class. They wore not only bracelets and armlets, but ear-rings, collars, and necklaces, which often consisted of strings of valuable pearls, or were enriched with other jewels. These ornaments were used to indicate the rank of the wearer, and this use has continued to be made of them in the east down to the present day. In Europe, bracelets and armlets were worn both by the classical nations and barbarians from the earliest times. The Gauls wore them; and the Sabines, as early as the foundation of Rome, had ponderous golden armlets on the left arm. The same was the case with the Samians about the same period. It does not appear that armlets were worn by men during the historical period of Greece, but ladies wore both armlets and bracelets of the most various materials and forms. Both generally passed round the arm several times, and the form of B. now most in fashion has been accurately copied from those twisted spirals described by Homer in the eighteenth book of the *Iliad*, line 401. Many examples of this kind of B., as represented on painted vases, will be found in Sir William Hamilton's work. We are indebted to the Greeks even for the idea of giving to these spiral bracelets the form of a snake, the best models of our present goldsmiths being exact copies of antique bracelets. The goddesses of the Greeks, like the blessed Virgin in Roman Catholic countries, were represented as attired in the style of ladies of the highest rank; and the celebrated marble statue of Aphrodite, preserved at Florence, exhibits traces of a metallic armlet. Amongst the Romans, armlets were frequently conferred upon soldiers for deeds of valor, of which an instance is mentioned by Livy (x. 44). Roman ladies wore bracelets, not only for ornament, but also for the purpose of containing amulets, which were supposed to effect miraculous cures. On this principle it is said that the emperor Nero wore on his right arm the skin of a serpent, inclosed in a golden armilla. But at Rome also, it was chiefly as an indication of rank or wealth that these ornaments were worn.

BRACES, on shipboard, are ropes attached to the yard-arms, and employed to shift the sails in a horizontal direction round the masts, so as to receive advantageously the wind that may be blowing at any particular moment. The phrases, "to brace to," "to brace about," "to brace the yards sharp up," etc., apply to this operation.

BRACHE (Fr. *braque*, diminutive *brachet*), a term frequently employed by the older English authors to designate some kind of dog. To what kind this name belonged, is, however, not very certain. The probability appears to be, that it was applied to hounds or hunting-dogs in general. The term is believed to be of Celtic derivation (from *bracach*, grayish, badger-colored, or *breac*, spotted), and to have originally signified gray or spotted dog.

BRACHIAL ARTERY is that portion of the great arterial trunk supplying the upper extremity between the armpit and the elbow; in other words, it is the continuation downwards of the axillary artery. The B A. runs along the inner side of the arm, just behind the inner margin of the biceps muscle, and behind the great median nerve. Here it may be pressed against the bone, in cases of bleeding from any point below. In its course the B. A. gives off, 1*st*, the superior profunda branch, which winds round the back of the arm-bone, and re-appears on the outer side, where it joins some twigs coming up from the radial artery; 2*d*, an artery which enters the bone to supply its medullary membrane; 3*d*, the inferior profunda, which, running down behind the internal condyle (the funny bone) of the humerus, joins branches coming from the ulnar artery; 4*th*, a short branch, the anastomotica magna, which breaks up into numerous branches inosculating round the elbow.



Brachial Artery.
c, brachial artery; *d*, superior profunda branch; *e*, inferior profunda; *f*, anastomotica magna.

BRACHIO'PODA (Gr. arm-footed), or PAL'LIOBRANCHIA'TA (Gr. mantle-gilled), a class of molluscous animals, having bivalve shells, but differing in important points from the vast majority of recent mollusks with bivalve shells, the *lamellibranchiata* (q.v.). The chief differences existing in the shelly covering itself have been already pointed out in the article bivalve shells (q.v.), but those of internal structure are still more important. The mantle or *pallium* (see MOLLUSCA) in the B. consists of two broad expansions or lobes, covered by the two valves of the shell, and inclosing all the other soft parts of the animal; whilst respiration or the aëration of the blood is carried on by the surface of these lobes themselves, traversed by minutely ramifying blood-vessels, extended into processes, and furnished, especially along the edge, with vibratile cilia which create a continual current in the surrounding water, and thus keep up a fresh supply, from which the necessary air may be obtained. The organs by which food is procured are also remarkable—two long arms arising from the sides of the mouth, and disposed wholly or partly in spiral curves, when not extended to seek or seize prey. These arms are usually furnished with numerous vibratory filaments, which are supposed not only to aid in the capture of prey, but in the maintenance of the current necessary for respiration. The B. are attached to solid bodies either by a footstalk or by one of the valves of the shell. Of existing species, the *terebratulæ* or lamp-shells (q.v.) are by far the most numerous; but even these appear to have existed in far greater numbers in former geologic periods, and of some of the other families of B. only a single species is known to exist, or the existing species are very few, whilst the fossil species are very numerous. The existing species are very widely diffused over the globe. All of them are marine, and one (*crania personata*) has been brought up from the depth of 255 fathoms. The B. are regarded as exhibiting structural affinities not only to the *ascidia* (q.v.) and the *lamellibranchiata*, between which they are commonly placed, but also to the class *bryozoa* or *polyzoa* among *zoophytes* (q.v.).

BRACHISTOCHRONE, the curve of the quickest descent, or the curve which a falling object must make between two points which are not in the same vertical line, if it descended in the shortest possible time. The curve is the common cycloid.

BRACHYL'OGUS, the title of a work containing a systematic exposition of the Roman law, compiled probably in the 12th c., though some assign it to the reign of Justinian. The earliest extant edition was published at Lyons in 1549, under the title of *Corpus Legum per Modum Institutionum*, and the title *Brachylogus totius Julis Civites* first appears in an edition dated 1553. Its value is chiefly historical.

BRACHYP'TERÆ, or BRACHYP'TERES (Gr. short-winged), in ornithology, that section of the order of *palmipedes* (q.v.), or web-footed birds, in which the wings are short, and the feet are placed far back, so as to compel the birds to assume a nearly erect posture when on land. They are all very aquatic in their habits, and excel in diving, so that the name DIVERS is sometimes used as equivalent to B.; but that name is also not unfrequently applied to other aquatic birds, and is sometimes restricted to the genus *colymbus*. Auks, puffins, penguins, grebes, guillemots, and divers (*colymbus*) are among the brachypteræ.

BRACKEN, a co. in n.e. Kentucky, on the Ohio and Licking rivers; 200 sq.m.; pop. '80, 13,508—814 colored. Productions agricultural; co. seat, Augusta.

BRACKENRIDGE, HENRY M., 1786–1861; b. Penn., son of Hugh Henry. He was a lawyer of long practice in Maryland; district judge of Louisiana, in which position he was useful to the government in the war of 1812, of which war he wrote a history. He advocated the acknowledgment of the independence of South American states, and his pamphlet on the subject was deemed of sufficient importance to receive an official answer from the Spanish minister at Washington. Subsequently he was commissioner to the new republics, and in return published *A Voyage to South America*. He was judge of the w. district of Florida for ten years; then removed to Petersburg, where he was chosen to congress. In 1841, he was commissioner under the treaty with Mexico. Besides many essays on various subjects, he published in 1859, in defense of his father, a *History of the Whisky Insurrection*.

BRACKENRIDGE, HUGH HENRY, 1748–1816; b. Scotland; a jurist and author; graduate at Princeton, N. J.; chaplain in the continental army; prepared to practice law; edited the *United States Magazine* of Philadelphia; began law practice at Pittsburgh; in 1799 appointed judge of the Pennsylvania supreme court, and held the office until his death. He was concerned in the "Whisky Insurrection" in 1794, and published a defense of his course. He wrote much in verse, the most popular being, *Modern Chivalry, or the Adventures of Capt. Farago*, a humorous burlesque.

BRACKET, an ornamental projection from a wall, used for the purpose of supporting a statue, bust, or the like. See CORBEL. Brackets may be either of stone or wood, and they are sometimes elaborately designed and carved. The term B. is also employed in joinery, etc., to designate supports, in the form of a bent knee, of shelves, galleries, etc. B. is also generally applied to such gaslights as project from the wall.

BRACKETT, EDWIN E., b. Maine, 1819; a sculptor of eminence, known mainly by his busts of American celebrities: Washington Allston, Richard H. Dana, Bryant,

Choate, Longfellow, Sumner, Garrison, John Brown, Benjamin F. Butler, Wendell Phillips, and others.

BRACKETT, WALTER M., brother of Edwin E., b. Maine, 1823; noted as a painter of game fish.

BRACKLESHAM BEDS, a group of highly fossiliferous strata in the middle eocene formation, included in the Bagshot series (q.v.).

BRACT, or BRAC'TEA, in botany, a leaf from the axil of which a flower or a floral axis is produced, instead of an ordinary leaf-bud or branch. Bracts are sometimes called floral leaves. The term B. is not, however, generally employed when, as is often the case, there is no marked difference from the ordinary leaves of the plant; but the flowers are said to be axillary, or in the axils of the leaves. On the other hand, the term B. is very frequently applied to all altered leaves interposed between the ordinary leaves and the flower or flowers. In this case, they are sometimes very small and scale-like. The ordinary leaves often pass, by imperceptible gradations, into bracts, diminishing in size becoming more simple, and often scariose. Bracts are generally entire, even when the ordinary leaves are divided. They are sometimes colored so as apparently to form part of the flower, and sometimes crowded, so as to resemble an involucre or an outer calyx. They appear to serve purposes analogous to those of leaves, or, when colored, of petals. When the primary floral axis is branched, bracts (sometimes distinguished as *racteolbes* or *bractlets*) are often to be seen at its ramifications. Bracts sometimes fall off at an early stage, sometimes they are more permanent, and sometimes they even remain to cover and protect the fruit.

BRACTON, HENRY DE, an English ecclesiastic and chief justiciary in the reign of Henry III. He took the degree of doctor of laws at Oxford, and was itinerant justice for Nottingham and Derby counties in 1245. In 1265, he was appointed chief justiciary. He wrote a comprehensive and systematic work on the laws of England, modeled after the "Institutes" of Justinian.

BRADBURN, SAMUEL, 1751–1815; b. Gibraltar; son of an English soldier; became a Wesleyan local preacher in England in 1773, and the next year an itinerant. He was one of the natural orators of early Methodism, endowed with ready wit and pathos. In 1799 he was president of the Wesleyan conference. After his death his *Sermons on Particular Occasions* were published.

BRADBURY, WILLIAM B., 1816–68; b. Maine; a composer of sacred music, and author in whole or in part of many books for Sunday-schools and choirs, among which are *The Shawm; The Jubilee; The Temple Choir; The Golden Choir; Fresh Laurels,* etc. His works have had much popularity.

BRADDOCK, EDWARD, a British maj.gen., commander against the French in America in 1755, arrived in Feb. of that year at Richmond, Va., and with a force of 2000, British and provincial troops, reached the Monongahela, a branch of the Ohio, on July 8. Leaving the baggage behind, on the 9th, his force moved forward to invest Fort du Quesne, now Pittsburg, Penn., when, from his slighting the warning of his American officers, of the probability of a surprise, the troops, in passing through a deep forest ravine, fell into an ambuscade of Indians, while they were attacked in front by the French, and half of them slain. The rest made a hasty retreat under col., afterwards gen. Washington, B.'s aide-de-camp, the only one of his officers who escaped with life. B., mortally wounded, was carried on a tumbril 40 m. to where the baggage had been left, and there he died.

BRADDON, Miss MARY ELIZABETH, one of the most popular novelists of the day, was born in London in the year 1837. Her father, Mr. Henry Braddon, was a solicitor. She very early showed a turn for literature, which she indulged in the usual manner, by sending verses and other trifles to the magazines and newspapers. In 1860, she essayed a somewhat more sustained effort in a little *commedietta* called *The Loves of Arcadia,* which was brought out at the Strand theater; and the year after, she published a volume of verse entitled *Garibaldi and other Poems.* Neither these, however, nor the tales which she now began to issue through the medium of the *Temple Bar* and *St. James's Magazine* —*Lady Lisle, The Captain of the Vulture, Ralph the Bailiff,* etc.—in any decisive way succeeded in drawing to her the attention of the public. Her first great success came with the publication, in 1862, of *Lady Audley's Secret,* which instantly attained a great popularity. This has since been extended by the appearance of *Aurora Floyd, Eleanor's Victory; John Marchmont's Legacy; The Trail of the Serpent; The Ladies' Mile; Sir Jasper's Tenant; Only a Clod; The Doctor's Wife; Run to Earth; The Lovels of Arden; Birds of Prey; Dead Sea Fruit; To the Bitter End; Strangers and Pilgrims; Weavers and Weft; The Cloven Foot* (1879), etc. Miss B. has contributed very extensively to *Belgravia,* a London magazine which she conducts. Few books of the period have secured a wider circle of readers than Miss Braddon's. They mainly depend for their interest on good bold effects of what is termed, in the slang of the day, *sensation,* and the art of their appeal to "that low vice, curiosity," in the conduct of a story, carefully leading up to some suspended and unforeseen *dénouement.* In their particular way, though without much claim to attention as regards either character or sentiment, they display undoubted talent: in style, they are fresh and vigorous, and their narrative power strongly excites the reader's interest. Miss B. is still in uninterrupted literary activity.

BRADFORD, a co. in n.e. Florida, on the Santa Fe river; intersected by the Atlantic and Gulf, and the West India Transit railroads; 940 sq.m.; pop. '70, 3691—824 colored. Productions, corn, cotton, sweet potatoes, and molasses. Co. seat, Lake Butler.

BRADFORD, a co. in n.e. Pennsylvania, bordering on New York; 1170 sq.m.; pop. '70, 53,204; in '80, 58, 534. Besides short railroads to its mines, the Northern Central and Lehigh Valley railroads traverse it. The rivers are the Susquehanna, the Towanda, the Wyalusing, and Sugar Creek. The surface is hilly, and thickly wooded. Iron, coal, and sandstone are abundant. The main article of export is lumber, but agriculture is the chief occupation. Co. seat, Towanda, 77 m. from Pittston.

BRADFORD, a t. in Essex co., Mass., on the Merrimac river, at the junction of the Boston and Maine and Newburyport railroads. A bridge connects B. with Haverhill. The B. academy for young ladies is an old and celebrated institution, affording a high grade of instruction. Shoe manufacturing is the leading business. Pop. '80, 2,643.

BRADFORD, an important manufacturing town in West Riding, Yorkshire, on a tributary of the Aire, at the meeting of three vales, 8 m. w. of Leeds. Pop. in '71, 145,827; of whom considerably more than one half are immigrants from other districts. The area of the parish is 34,146 acres, extending to the confines of Lancashire. It returns two members to parliament, having been created a parliamentary borough in 1832. It became a municipal borough in 1847. B. is the chief seat in England of the spinning and weaving of worsted yarn, and the great mart for the long wools used in worsted fabrics. Cottons are also manufactured. There are more than 200 mills, employing 40,000 persons. Notwithstanding the large population, and the nature of their employment, the annual rate of mortality is now only 24 per 1000. Twenty years ago, the rate was 30. The Saltaire alpaca and mohair mills, on the Aire, 3 m. from B., cover more than 6 acres. This establishment, erected by Sir Titus Salt, bart., is the most splendid manufacturing concern in England. Here is also the largest silk-mill in England, built by Mr. S. C. Lister. Coal and iron mines occur near Bradford. There are over 20 churches belonging to the establishment in the borough, and many dissenting and Roman Catholic churches. The gross estimated rental of the borough is £600,000, and the ratable value £500,000. It has two public parks, each containing more than 50 acres, besides smaller ones, and also many excellent charities. The Romans seem to have worked iron mines here, Roman coins having been found in foundry refuse near the town. The early history of B. is connected with the castle of the Laceys here. In the civil wars, the people of B. took the parliament side, and twice defeated the royalists, but were afterwards themselves defeated by the earl of Newcastle. In a riot at B., against the introduction of worsted power-looms, in 1826, two of the rioters were shot dead by the defenders of the mill which contained the obnoxious machinery, and many more were wounded. In 1825, a strike for increased wages, in which 20,000 persons were concerned, lasted six months. The Baptists, Independents, and Wesleyans have colleges near Bradford. This town is the seat of the first English temperance society. At Fulneck, 3 m. e. of B., is a Moravian settlement, founded in 1748, where Montgomery the poet was educated. B. has been latterly much improved in its buildings, and possesses a spacious and elegant public hall, in which the national association for promoting social science met in 1859, and the British association in 1873. The merchants of B. are distinguished by their liberality and enterprise. Their warehouses form the great wholesale market in the worsted and alpaca trade.

BRADFORD, ANDREW, 1686–1742; b. Philadelphia; son of William (the printer). He was the only printer in Pennsylvania from 1712 to 1723. On Dec. 22, 1719, he started the third newspaper in the colonies, and the first in Philadelphia, called *The American Weekly Mercury.* He kept a bookstore, and was for a time postmaster of the city. He was the first printer in Philadelphia to employ Benjamin Franklin as a typesetter.

BRADFORD, JOHN, an English minister; b. early in the reign of Henry VIII. He was secretary to the paymaster of the English forces in France, and used money not his own, but made restitution and resigned his place. He then studied divinity, and bishop Ridley of London appointed him his chaplain. B. was also chaplain to Edward VI., and one of the most popular preachers in the kingdom. When Mary came to the throne he was accused of sedition and sent to the Tower, and finally tried before Gardiner, where he defended his principles to the last. He was condemned, and burnt at the stake in Smithfield, July 1, 1555. Many of his short works are found in the issues of tract societies.

BRADFORD, WILLIAM, 1588–1657; b. England; one of the pilgrims, and second governor of Plymouth colony. He sailed from Leyden, Holland, in the *Mayflower.* One of his first acts, as the successor of gov. Carver, was to confirm the treaty with Massasoit, just in time to suppress a dangerous Indian conspiracy. Bradford's name is in the second patent, which conferred upon him, his "heirs, associates, and assigns," the territory named. He was governor, with some brief interruptions, for 31 years, but declined to serve further. B. was the author of a *History of Plymouth Colony* from 1602 to 1647.

BRADFORD, WILLIAM, 1658–1752; b. England; one of the Quakers who came to Pennsylvania in 1682, landing in the woods where Philadelphia now stands. He was

the first printer in Pennsylvania, printing an almanac in 1686. Having become obnoxious to some of the leading settlers for printing so-called seditious writings (for which offense he was tried but not convicted), he settled in New York in 1693, and there printed the laws of the colony. Oct. 16, 1725, he began the first newspaper in that city, *The New York Gazette*. Three years later he set up a paper mill at Elizabeth, N. J. For 30 years he was the only printer in the colony of New York. His body lies in Trinity church-yard.

BRADFORD, WILLIAM, 1755–95; b. Philadelphia; a lawyer, graduated at Princeton. He served as an officer in the revolutionary army, and was appointed attorney-general by president Washington.

BRADFORD, WILLIAM, an American painter, b. of Quaker parents in 1827, at New Bedford, Mass. He was educated for business, and for a while engaged in it at Fairhaven, Mass., but afterwards developed a talent for painting, especially in subjects relating to ships, the sea, and the shore. He made several voyages along the coast of New England and northward as far as Greenland. These furnished him with suggestions for some of his best pictures, among which are "A Stiff Breeze in the Harbor of Eastport," "A Squall in the Bay of Fundy," "The Coast of Labrador," and "Crushed by Icebergs."

BRADFORD CLAY, a member of the lower oolite, is a blue unctuous clay, occurring at Bradford near Bath, and extending for a few miles around: it is never more than 40 or 50 ft. in thickness. It is remarkable for the occurrence in it of large numbers of a crinoid (q.v.), (*apiocrinites Parkinsoni*). The upper surface of the calcareous rock on which the clay rests is completely incrusted over with a continuous pavement formed of the stony bases of this crinoid. It had once formed the bottom of a sea, in which these animals lived, their stems bending with every motion of the water, and their star-like crown of arms outstretched in search of food. At length, however, the clear water was invaded by a current largely charged with mud, which threw them down, and broke most of their stems off near the base. The stem, body, and arms have been dismembered, and are confusedly scattered through the clay.

BRADFORD, GREAT (Sax. *Bradanford*, broad ford), a t. in the co. of Wilts, on both sides of the Avon, and on the Kennet and Avon canal, 6 m. e.s.e. of Bath. Pop. '71, 4871. It has been noted for many centuries for its manufacture of fine broadcloths. Kerseymeres were first made here. An India-rubber manufactory has been also lately established. The remains of a monastery, founded in the 7th c. by St. Aldhelm, are still visible.

BRADLAUGH, CHARLES, b. 1833; an English atheist and sympathizer with radical revolutions; the editor of a paper devoted to reform. In 1873, he made a short visit to the United States, lecturing in the larger cities. In 1880, he was elected to parliament by a vote combined of various elements on the "liberal" side, though that party cannot be considered as favoring his extreme views. The tories made strong opposition to his admission to the house, partly because he declined to take the usual oath, although he was willing to affirm. A long debate ensued in which Bradlaugh's atheism was held up as a reason for non-admission; but finally, on motion of Gladstone, he was permitted to affirm and take his seat.

BRADLEY, a co. in s. Arkansas, on Saline river; 958 sq.m.; pop.'80, 6,285—2,211 colored. The surface is level; productions, corn, cotton, sweet potatoes, etc. Co. seat, Warren.

BRADLEY, a co. in s.e. Tennessee, on the Georgia border, 400 sq.m.; pop. '70, 11,652—1,700 colored. The East Tennessee, Virginia, and Georgia railroad and Dalton branch pass through the county. It has an uneven surface, mountainous in some parts. Productions mainly agricultural. Co. seat, Cleveland.

BRADLEY, EDWARD, b. 1827; an English novelist, more generally known by his *nom de plume* of "Cuthbert Bede." He was educated at Durham university and took holy orders, but has devoted his attention almost entirely to literature. *Verdant Green* is one of the best known of his stories.

BRADLEY, Dr. JAMES, one of the most distinguished astronomers and discoverers of any time or country, was b. at Sherborne, in Gloucestershire, in 1692. He received his early education at a boarding-school at North Leach, whence, being destined for the church, he proceeded to Oxford. Soon after graduating, he obtained successively the livings of Bridslow and of Welfrie, in Pembrokeshire; but there is reason to fear that his mathematical pursuits considerably distracted his attention from his clerical duties. Devoting himself to mathematics and astronomy, he soon exhibited such a genius for these pursuits as to win the friendship of all the leading mathematicians of his time, among others, of the great Isaac Newton, and to get elected a member of the royal society. About the time of his election, 1721, he became, in his 29th year, Savilian professor of astronomy at Oxford, resigned his livings, and devoted himself wholly to science. In 1727, he published his theory of the aberration of the fixed stars, containing the important discovery of the aberration of light, to which, it is related, he was led somewhat by accident, as sir Isaac Newton was to the theory of gravitation.

What suggested this discovery to B., it is said, was the observation that the vane of a yacht in which he was sailing never lay in the line of the wind, but was always inclined to it at an angle depending on the line and amount of the yacht's motion. This led him to a train of thought resulting in the proposition, that the direction in which we see a star is not that in which it actually lies, but inclined to it by an angle depending on the direction of the earth's motion round the sun at the time of the observation, and the ratio of its velocity to that of light. See ABBERRATION. Three years after this publication, B. became lecturer on astronomy and physics at the Oxford museum. His next discovery was that the inclination of the earth's axis to the ecliptic is not constant, a fact including the explanation of the procession of the equinoxes and the nutation of the earth's axis. This discovery constitutes a great epoch in astronomy. Latterly, B. became regius professor of astronomy at Greenwich, where, by his observations, he still further enriched the science. He declined the living of the parish of Greenwich, which was offered to him, and was favored by the crown with a pension of £250 a year for his services to commerce and navigation. Towards the end of his life, B. was elected member successively of almost all the leading scientific societies in Europe. He died on the 2d of July, 1762, in his 70th year. B. is described as having been gentle, modest, compassionate, and liberal; little given to speaking or writing, from diffidence and the fear of hurting his reputation. No man ever better merited the title of a great astronomer.

BRADLEY, JOSEPH P., LL.D., b. N. Y., 1813; graduated at Rutgers college, and practised law in Newark, N. J. In 1870 he was appointed one of the justices of the U. S. Supreme court. He was a member of the electoral commission of 1877.

BRADSHAW, HENRY, an English poet of the 15th century. He was one of the Benedictine monks of St. Werberg in Chester. His works are *De Antiquitate et magnificentia Urbis Cestris, Chronicon;* and *Life of the Glorious Virgin St. Werberg.* They are now very rare.

BRADSHAW, JOHN, an eminent Puritan, was b. in 1586, of a good family in Cheshire, and studied law at Gray's inn. Called to the bar, he gained a good practice by his ability and learning, especially as a chamber council. In Oct., 1646, he was appointed a commissioner of the great seal, and in Feb., 1647, chief-justice of Chester. In Oct., 1648, he received the degree of sergeant, and in the following Jan., was elected president of the high court of justice for the trial of king Charles I. As the reward of his services on that solemn occasion, he was made president of the council of state, and chancellor of the duchy of Lancaster, besides the grant of estates worth £4000 per annum, the deanery house of Westminster for a residence, and £5000 to furnish it. B., however, refused submission to the Protector. He was an able lawyer, but not an able politician. His mind was rigid rather than broad, and, in consequence, he was unable (like so many others of the stern fanatical republicans of his time) to see or comprehend the necessity for a great iron rule like Cromwell's. He even engaged in some fifth-monarchy and other plots against Cromwell, but his respectable character and past services saved him from molestation. He was deprived, however, of his office as chief-justice of Chester. After Oliver's death, he was lord president of the council of state, and a commissioner of the great seal under Richard. His last public act was to protest against the violent seizure of speaker Lenthall by the army. He died Nov. 22, 1659. His body was buried with pomp in Westminster abbey, but it was afterwards exhumed and hung on a gibbet, with those of Cromwell and Ireton.

BRADSHAW'S RAILWAY GUIDE, the pioneer, and still the type, of that now extensive class of publications whose object is to convey all necessary information in regard to traveling. It derives its name from George Bradshaw, originally an engraver and printer in Manchester, who, in 1839, issued an occasional work called the *Railway Companion,* which was corrected by means of another work, in the form of a broad sheet, styled the *Monthly Time Tables.* This sheet was frequently delayed to the 5th or 6th of the month, and was subject to changes made by the companies, perhaps in the middle, or even the latter end of the month. By great efforts, the railway companies were induced to consent to adjust their tables, once for all, for the beginning of each month; and Mr. Bradshaw having established an agency in London, the first number of the monthly *Railway Guide* was brought out in Dec., 1841. The second number now before us, published "1st month (Jan.), 1842," runs to 32 pages, and contains 42 or 43 lines of railway, in England only, without any advertisements. Through the suggestions and exertions of Mr. W. J. Adams, the London agent and publisher, the plan was gradually enlarged and perfected, and resulted in the *Railway and Steam-navigation Guide* for Great Britain and Ireland, so well known to the public. The *Guide* now extends to upwards of 450 pages, which comprise the needful knowledge regarding all lines and branches in the three kingdoms; besides copious steamboat information; full details regarding coaching in Scotland; and numerous advertisements—price 6*d.* The information is obtained from the companies, at the last moment, in time to appear on the 1st of the month. The *Guide* has attained an immense circulation, and given birth to many publications of a similar character. Its plan has been imitated in France and Germany, in America, and even at the antipodes, where a *Bradshaw* is published at Sydney; and

in spite of many rivals, the original work has always maintained its place in general estimation.

In 1847, the first number of *Bradshaw's Continental Railway Guide* was issued, which has prospered no less than the British *Guide*. In addition to the tables, as furnished by the companies abroad, it contains a large quantity of topographical information. A series of *handbooks* was also projected by Mr. Bradshaw, which includes Great Britain, France, Switzerland, etc., but is still incomplete. The handbooks of the *Overland Journey*, and to the *Presidencies of India*, were published after Mr. Bradshaw's death, which occurred in 1853.

BRADSTREET, ANNE, b. England, 1612; daughter of gov. Thomas Dudley, of Massachusetts; married to Simon B., who also became governor. She was the earliest writer of verse in America, her first volume being published (in England) in 1690, under the title, *The Tenth Muse, lately sprung up in America*, containing "A Complete Discourse and Description of the Four Elements, Constitution, Ages of Man, Seasons of the Year, together with an Exact Epitome of the Four Monarchies, viz., the Assyrian, Persian, Grecian, Roman;" also a dialogue on politics between old and new England, "with divers other pleasant and serious poems." Several editions of her works have been published. She died in 1872.

BRADSTREET, JOHN, 1711–74; an English officer who spent nearly his whole life in service in the American colonies. In 1746, he was governor of St. John's, Newfoundland. He served in the French war, was in the attack on Ticonderoga in 1758, and soon afterward surprised and captured fort Frontenac. He served with Amherst in the Ticonderoga expedition of 1759, and against the Indians in the west, making a treaty with them at Detroit in 1764. In 1772, he was made maj.gen.

BRADSTREET, SIMON, 1603–97; b. England, steward to the countess of Warwick; married Anne (the poetess), daughter of Thomas Dudley, and was one of the earliest in founding a colony in Massachusetts. In 1630, he arrived at Salem, vested with the office of assistant judge; was secretary, agent, and commissioner of the united colonies, and in 1662 was sent to congratulate Charles II. on his restoration. From 1630 to 1679 he was assistant governor; 1673–79, deputy governor; and 1679–86, governor, until the charter was revoked. He was restored to office in 1689 and remained in power until the new charter arrived in 1692, when he was made first councilor.

BRADWARDIN, or BREDWARDINE, THOMAS; b. near the close of the 13th c.; archbishop of Canterbury. He was educated at Oxford, and became chancellor of the university and professor of divinity. He was chaplain and confessor to Edward III., whom he attended during his wars in France. He died of plague at Lambeth, 40 days after his consecration as archbishop, in 1349. His principal work is a treatise against the Pelagians. He wrote also on arithmetic, geometry, the quadrature of the circle, and proportion of numbers.

BRADY, HUGH, 1768–1851; an American officer who served under Wayne, and with distinction in the battle of Chippewa in 1812.

BRADY, JAMES TOPHAM, 1815–69; b. New York; a lawyer, educated by his father, who was also a lawyer and a judge. The son became eminent for eloquence, and for almost unbroken success in the cases undertaken by him. In New York he was popular both as a lawyer and a citizen, and especially admired as an off-hand speaker. He contributed largely to newspapers and magazines, but left no collected works.

BRADY, NICHOLAS, D.D., b. Ireland, 1659; with Nahum Tate he made a metrical version of the Psalms of David, and also translated Virgil's *Æneid*. He was a promoter of the revolution, but when the troubles broke out in Ireland in 1690, by his personal influence he thrice prevented the burning of his native town of Bandon, which James II. ordered should be destroyed. He died in 1726.

BRADY, WILLIAM MAZIERE, D.D., b. Ireland, 1825; graduate of Trinity college, Dublin; one of the leaders in the movement for the disestablishment of the Irish church, and the author of works on the ecclesiastical history and antiquities of Great Britain and Ireland.

BRADYPUS. See SLOTH.

BRAEMAR, (including the united parishes of Braemar and Crathie), an extensive Highland district, occupying the s.w. corner of Aberdeenshire, in the heart of the Grampian mauntains, and intersected by the upper part of the Dee and its tributaries. The chief mountains are Ben Macdhui (q.v.); Cairntoul, 4220 ft.; Braeriach, 4225; Ben-a-Buird, 3851; and Ben Avon, 3826, on the n.; and Lochnagar (q.v.), on the south. Patches of snow lie on these mountains all the year round. The rocks of B. are granite, gneiss, and quartz, with beds of primary limestone, and masses of serpentine, trap, and porphyry. Most of the district is uncultivated, and consists of healthy tracts, while about a twentieth of the surface is in wood. The natural woods are birch, alder, poplar, and rowan, and the planted chiefly larch and Scotch fir. The fir-timber of the ancient Caledonian forest of Mar, now nearly all cut down, is, for size and quality, the best in the kingdom. Red-deer, roes, grouse, ptarmigan, and alpine hares abound. Many rare alpine plants are found on the mountains and in the glens. Black-faced sheep and small black-horned

cattle are reared. Here the earl of Mar first raised his standard for the pretender in Sept., 1715. The district is intersected by the great military road from Blairgowrie to Fort George, made by gen. Wade. In the e. part of the district is Balmoral (q.v.); and near its center is the small village of Castleton of B., a favorite resort for travelers, sportsmen, and lovers of grand scenery. Pop. '71, 1566, many of whom still speak Gaelic.

BRAG, a game at cards, usually played by from four to eight persons. The whole pack is used, and the cards rank as at whist except the nines and knaves, which are called "braggers," and rank the same as any cards with which they may be held. An ace and a nine and a knave are called three aces, and a deuce and two brag cards make three deuces, etc. The highest hand is a pair royal, three of a kind, ace being highest; next best, highest pair, and last the single card. There is no playing, the hands are merely shown, and the highest wins the stake.

BRA'GA, a city of Portugal, capital of the province of Minho, is situated on an eminence between the rivers Cavado and D'Este, about 35 m. n.e. of Oporto. The neighborhood is charming, especially along the banks of the river Cavado. B. is surrounded by old walls, flanked with towers, and defended by a castle. It is the residence of the primate of Portugal, who has a palace here. It has also a fine Gothic cathedral, several spacious squares; and manufactures of linen, hats, cutlery, fire-arms, jewelry, etc. Pop. 19,514. It is a very ancient place, being supposed to owe its origin to the Carthaginians. In the time of the Romans, the city was named *Bracara Augusta*, and the ruins of a temple, an amphitheater, and an aqueduct, belonging to that era, still remain. Not far from B. stands the celebrated *Sanctuario do bom Jesus do Monte*, which is still a place of pilgrimage. After the Suevi had taken Lusitania from the Romans, B. was made the metropolis; and here, at a council held in 563 A.D., the Suevi, with their king, renounced the errors of Arianism, and submitted to the teaching of the Roman Catholic church. After the fall of the Suevian and West-Gothic kingdom, B. fell into the hands of the Arabs, from whom it was taken by the forces of Old Castile in 1040. After the establishment of the Portuguese dynasty, it was annexed to the crown of Portugal.

BRAGAN'CA, the name of two considerable towns in Brazil.—1. B., a seaport of about 6000 inhabitants, at the mouth of the Caite, which enters the Atlantic about 100 m. to the e.s.e. of the Amazon.—2. B., an island city of about 10,000 inhabitants, 50 m. to the n.e. of San Paulo, and about 200 to the w. of Rio de Janeiro.—The first is about a degree to the s. of the equator, and the second about a degree to the n. of the tropic of capricorn.

BRAGAN'ZA, or BRAGANÇA, a city of Portugal, capital of the province Tras-os-Montes, is situated in a pleasant and fertile district, on the river Fervença, an affluent of the Sabor. The city is surrounded with walls; has two castles, partly in ruins, of which one was the ancestral seat of the dukes of Braganza; and has manufactures of silk and velvet. Pop. 5000. This city gives its name to the house of Braganza, the present ruling dynasty in Portugal, John, eighth duke of Braganza, having ascended the throne as John IV., when the Portuguese liberated themselves from the Spanish yoke in 1640. See PORTUGAL.

BRAGANZA, HOUSE OF, the title of the family reigning in Portugal, so named from the old dukes of Braganza. The first duke was a bastard son of king John I. After the death of Sebastian without issue the people, who were forbidden by the constitution of 1139 to accept a foreign prince, took up with the Braganzas; but the Spanish kings ruled Portugal by force until 1640, when Don John, duke of Braganza, was made king with the title of John IV. and the family has ruled ever since.

BRAGG, BRAXTON, b. N. C., 1815; a graduate of West Point; served in the Florida war, and in the Mexican war, where his bravery at Fort Brown, Monterey, and elsewhere, was conspicous. His conduct at Buena Vista secured him his brevet as lieut. col. He resigned from the army in 1856. When the civil war broke out he joined the confederates, and in a short time was made general, succeeding Albert Sydney Johnson, who was at killed Shiloh. He met with several reverses, was defeated by gen. Grant at Chattanooga, and soon afterward was relieved from command.

BRAGI, son of Odin and Frigga, in the Norse or Scandinavian mythology, was the god of poetry and eloquence. Upon his tongue were engraved the runes of speech, so that it was impossible for him to utter a sentence that did not contain wisdom. According to the older or poetic Edda, he was the most perfect of all scalds or poets, and the inventor of poetry, which is designated by a kindred word, *bragr*. Unlike Apollo, who, in the Greek mythology, is represented as enjoying eternal youth, B. was supposed to be an old man with a long flowing beard; but his brow was always mild and unwrinkled. B.'s wife was Idunna. Together with Hermothr or Hermode, he received and welcomed all those heroes who had fallen in battle, on their arrival in Valhalla. On festive occasions, as well as on the burial of a king, a goblet, called Bragafull (B.'s goblet), was presented, before which each man rose up, made a solemn vow, and emptied it.

Several German periodicals and works, intended to cherish a national spirit, have taken the name of Bragi.

BRAHAM, JOHN, a celebrated tenor-singer, of Jewish origin, was b. in London in 1777, and d. Feb. 15, 1856. He had an unusually long professional career, having sung on the stage at the age of ten, and continued to make occasional appearances at concerts until within a few years of his death. About the close of the 18th c. he visited France and Italy for improvement; returning to London, his triumph was transcendent, and from that time, for half a century he held the reputation of one of the greatest tenor-singers in Europe. It was as a concert-singer that he excelled most, and his great declamatory power and florid execution made his singing of the national songs wonderfully effective.

BRAHE, TYCHO, one of the most distinguished names for which astronomical science can boast, was born at Knudsthorp (a place near the Baltic), in Denmark, in 1546. He was descended from a noble family, originally Swedish, and sent, at the age of 13, to the university of Copenhagen, where he had not been more than a year when an eclipse of the sun turned his attention to astronomy. His uncle, who destined him for the law, furnished him with a tutor, and sent him to Leipsic in 1562; but B., who cared nothing for that study, devoted just so much time to it as would save appearances, and while his tutor slept, busied himself nightly with the stars. By these surreptitious observations of the heavens, and with no other mechanical contrivances than a globe about the size of an orange, and a pair of rude compasses, he succeeded, as early as 1563, in detecting grave errors in the Alphonsine and Prutenic tables, and set about their correction. The death of an uncle, who left him an estate, recalled him to his native place in 1565, but he very soon became disgusted with the ignorance and arrogance of those moving in the same sphere with himself, and went back to Germany. At Wittenberg, where he resided for a short time, he lost part of his nose in a duel with a Danish gentleman; but for the lost organ he ingeniously contrived one of gold, that fitted so admirably, and was so naturally colored, that few could have detected that it was artificial. After a couple of years spent in Augsburg, he returned home, where, in 1572, he discovered a new and brilliant star in the constellation Cassiopeia. In 1573, he married a peasant girl, which his fellow-noblemen thought even more undignified than being addicted to astronomy; and that they considered very degrading in a gentleman, whose only becoming qualification was, in their estimation, expertness in the use of arms. After some time spent in travel, B. received from his sovereign, Frederic II., the offer of the island of Hven or Hoëne, in the Sound, as the site for an observatory, the king also offering to defray the cost of erection, and of the necessary astronomical instruments, as well as to provide him with a suitable salary. B. accepted the generous proposal, and in 1576 the foundation-stone of the castle of Uraniberg ("city of the heavens") was laid. Here, for a period of 20 years, B. prosecuted his observations with the most unwearied industry—with a zeal, in fact, sufficient to create a new epoch—one of the three great epochs indeed—in astronomy as a science of observation. See ASTRONOMY. The scientific greatness of B. was no protection against the petty prejudices of the nobles, who could not bear to see honor heaped on one who, according to their notions, had disgraced their order, nor against the meaner jealousies of physicians, who were annoyed at his dispensing medicine gratis to the poor. So long as his magnificent patron, Frederic II. lived, B.'s position was all that he could have desired, but on his death, in 1588, it was greatly changed. For some years under Christian IV., B. was just tolerated; but in 1597, his persecution had grown so unbearable that he left the country altogether, having been the year before deprived of his observatory and emoluments. After residing a short time at Rostock and at Wandsbeck, near Hamburg, he accepted an invitation of the emperor Rudolf II.—who conferred on him a pension of 3000 ducats—to Benatek, a few miles from Prague, where a new Uraniberg was to have been erected for him; but he died at Prague, on the 13th Oct., 1601. At Benatek he had Kepler as his assistant, and to the advice of B. that celebrated astronomer owed much. The scientific publications of B. are numerous.

BRAHILOV', IBRÄIL', or IBRAILA, is a free port of the Danubian principalities, on the left bank of the Danube, about 99 m. from its mouth, and the chief shipping port in Wallachia, whence large quantities of corn and other products are exported. The sturgeon fisheries on the Danube are a source of conisderable profit to B. A railway from Galatz to B., thence to Bucharest, was completed in 1873. Pop. about 30,000. During the war of 1854–1856, B. was occupied by Russian troops.

BRAHMA. In the religion and philosophy of the Hindus, this word has two meanings. The crude or undeclined form is *brahman*, the etymological signification of which is doubtful; when declined as a neuter noun, it has the nominative brahma (with the final syllable short); as a masculine, it is brahmā (with the *a* long). BRAHMĀ (neuter) designates the universal spirit, the ground and cause of all existence; which is not, however, conceived as an individual personal deity to be worshiped, but only as an object of contemplation. It is spoken of as "that which is invisible, unseizable, without origin, without either color, eye, or ear, eternal, manifold (in creation), all-pervading, undecaying—the wise behold it as the cause of created beings." The human soul is a portion of this universal spirit, and a man can only be freed from transmigration, and

be reunited to Brahmā, by getting a correct notion of it and of the soul.—BRAHMĀ (masculine) is one of the three chief gods of the Hindu pantheon, and is especially associated with the function of creation. See TRIMURTI. Yet he himself is a creation of or emanation from Brahmā, the first cause. The origin of Brahmā, and the way in which he created heaven and earth, is thus narrated by Manu:

"This universe was enveloped in darkness, unperceived, undistinguishable, unknowable, as it were entirely sunk in sleep. Then the irresistible self-existing lord, undiscerned, causing this universe with the five elements, and all other things, to become discernible, was manifested, dispelling the gloom. He who is beyond the cognizance of the senses, subtile, undiscernible himself, shone forth. He, desiring, seeking to produce various creatures from his own body, first created the waters, and deposited in them a seed. This [seed] became a golden egg, resplendent as the sun, in which he himself was born as Brahmā, the progenitor of all the worlds. Being formed by that first cause, undiscernible, eternal, which is both existent and non-existent, that male (purusha) is known in the world as Brahmā. That lord having continued a year in the egg, divided it into two parts by his mere thought. With these two shells he formed the heavens and the earth; and in the middle he placed the sky, the eight regions, and the eternal abode of the waters."—See Dr. J. Muir's *Original Sanskrit Texts*, vol. iv., 31.

In later times at least, B has had few special worshipers; the only spot where he is periodically adored being at Pushkara in Râjputana. He sometimes receives a kind of secondary homage along with other deities. B. is represented with four heads. See INDIA (section on *Religion*), TRIMURTI, VISHNU, SIVA.

BRAHMA (see *ante*), under which the more comprehensive term "Brahmanism" is employed to specify the system of religious institutions originated and elaborated by the Brahmans, who are and have been from an early period the sacerdotal and dominant caste among the Hindus. The earliest phases of religious thought in India of which a clear notion can now be formed, are exhibited in a body of writings which long ago came to be regarded as sacred, known under the collective name of *Veda*, "knowledge," or *Sruti*, "revelation." The Hindu scriptures consist of four separate collections of sacred texts, including hymns, incantations, and sacrificial forms of prayer. They are: 1, the *Rigveda;* 2, the *Saman*, or *Samaveda;* 3, the *Yajush*, or *Yajurveda;* 4, the *Atharvan* or *Atharvaveda*. Each of these four text books has attached to it a body of prose writings called *Brahmanas*, which explain the ceremonial application of the texts and the origin and import of the sacrificial rites for which they were supposed to have been composed. The *Samaveda* and the *Yajurveda* are for purely ritual purposes, and, as they are composed almost entirely of verses taken from the *Rigveda*, are of secondary importance. The hymns of the *Rigveda* are the earliest lyrical productions of the Aryan settlers in India which have come down to us. They all are old, though of varying periods, only the last book having the characteristics of a later appendage. Of the *Atharvan* about a sixth is found in the *Rigveda*. The religious thought of the old bards, as reflected in the hymns, is that of a worship of the grand and striking phenomena of nature regarded in the light of personal and conscious beings, endowed with powers beyond the control of man, yet sensible to his praises and actions. It was a nature-worship nearer than that of any other known form of polytheistic belief; a mythology comparatively little affected by those systematizing tendencies which, in other lands, led to the construction of a well-ordered pantheon and a regular organization of divine government. From the name, "the Shining Ones," given to these impersonations, it must be concluded that the more prominent objects of early adoration were the phenomena of light. In the primitive worship of the manifold phenomena of nature, it is not so much their physical aspect that impresses the human heart as the moral and intellectual forces which are supposed to move and animate them. The attributes and relations of some of the Vedic deities, in accordance with the nature of the objects which they represent, partake in a high degree of this spiritual element; but it is not improbable that in an earlier phase of Aryan worship the religious conceptions were pervaded by it to a still greater extent, and that the Vedic belief, though retaining many of its primitive features, has on the whole assumed a more sensuous and anthropomorphic character. This latter element is especially predominant in the attributes and imagery applied by the Vedic poets to Indra, the god of the atmospheric region, and the favorite figure in their pantheon. While the representatives of the prominent departments of nature appear to the Vedic bard as independent of each other, their relations to the mortal worshiper being the chief subject of his anxiety, a simple method of classification was already resorted to at an early time, consisting of a triple division of the deities into gods residing in the sky, in the air, and on the earth. It is not, however, until a later stage that this attempt at a polytheistic system is followed up by the promotion of one particular god to the dignity of chief guardian for each one of these three regions. On the other hand, a tendency is clearly traceable in some of the hymns towards identifying gods whose functions present a certain degree of similarity of nature. These attempts seem to show a certain advance from polytheism towards a comprehension of the unity of the divine essence. Another feature of the old Vedic worship tended to a similar result. The great problems of the origin and existence of man and the universe had early begun to engage the Hindu mind; and in celebrating the praises of the gods the poet was fre-

quently led by his religious and not wholly disinterested zeal to attribute to them cosmical functions of the very highest order. At a later stage of thought inquirers could not fail to perceive the inconsistency of such concessions of a supremacy among the divine rulers, and tried to solve the problem by conceptions of an independent power, endowed with all the attributes of a supreme deity, the creator of the universe including the gods of the pantheon. The names under which this monotheistic idea is put forth are mostly of an attributive character, and some are mere epithets of particular gods, such as *Prajapati*, "lord of creatures," and *Visrakarman*, "all-doer." But to some this theory of a personal creator left many difficulties unsolved. They saw that every thing around them, including man himself, was directed by some inward agent; and it needed but one step to perceive the essential sameness of these spiritual units, and to recognize them as so many individual manifestations of one universal principle. Thus a pantheistic conception was arrived at, and put forth under such names as *Purusha*, "soul," *Kama*, "desire," *Brahman* (neuter nom. sing., brahma), "devotion, prayer." Metaphysical and philosophical speculations were thus fast undermining the simple belief in the old gods, until, at the time of the composition of the *Brahmanas* and the *Upanishads*, we find them in complete possession of the minds of the theologians. While the theories crudely suggested in the later hymns are now further matured and elaborated, the tendency towards catholicity of formula favors the combination of the conflicting monotheistic and pantheistic conception; this compromise, which makes *Prajapati*, the personal creator of the world, the manifestation of the impersonal *Brahma*, the universal self-existent soul, leads to the composite pantheistic system which forms the characteristic dogma of the Brahmanical period.

The division into *castes* in India is well known. The hymn to Purusha names them as, 1, the Brahmanas; 2, Kshatriyas; 3, the Vaisyars; and, 4, the Sudras. There was a long conflict between the first and second of these castes, but the final subjection of the second left absolute power in the hands of the first, the Brahmans, or priests. They elaborated a system of laws, using some of Manu's code, in which they made no scruple to fortify and protect themselves. The very lowest class was of no importance, but the other three, however unequal to each other in privileges and social standing, were united by a common bond of sacramental rites, traditionally connected from ancient times with certain stages and incidents in the life of the Aryan Hindu, such as conception, birth, name-giving, the first taking out of a child to see the sun, the first feeding with boiled rice, the rites of tonsure, the youth's investiture with the sacrificial thread, and his return home on completing his studies, with the ceremonies of marriages, funerals, etc. The most important of these family observances is the rite of conducting the boy to a spiritual teacher, with which is connected the investiture with the sacred cord, ordinarily worn over the left shoulder and under the right arm, and varying in material according to the class of the wearer. This ceremony is supposed to constitute the second or spiritual birth of the arya, and is the preliminary act to the youth's initiation into the study of the Veda, the management of the consecrated fire, and the knowledge of the rites of purification, including the solemn invocation to *Savitri* (the sun), which has to be repeated every morning and evening before the rising and setting of that luminary. It is from their participation in this rite that the three upper classes are called the "twice born." The ceremony is enjoined to take place some time between the 8th and 16th year in case of a Brahman; for a Kshatriya between the 11th and 22d; and of a Vaisya between the 12th and 24th. He who has not been invested with the mark of his class within the prescribed time is forever excluded from uttering the prayer to the sun, and becomes an outcast, unless absolved from his sin by a council of Brahmans, when, after due purification, he resumes the badge of his caste. With one not duly initiated no righteous man is allowed to associate or to enter into connections of affinity. The duty of the Sudra (the lowest caste) is to serve the twice-born classes, particularly the Brahmans. One of this caste is excluded from all sacred knowledge, and if he perform sacrificial ceremonies he must do so without using holy utensils. No Brahman may recite a holy text where a man of the servile cast might overhear him, nor may he teach them the laws of expiating sin. The occupations of the Vaisya are connected with trade, agriculture, and the raising of cattle; while those of the Kshatriya consist in ruling and defending the people, administering justice, etc. Both these castes share with the Brahman the privilege of reading the Veda, but only so far as it is taught and explained to them by their spiritual preceptors. To the Brahman belongs the right of teaching and expounding the sacred texts, and also that of interpreting and determining the laws and rules of caste. Yet, in spite of those formidable barriers between the several orders, the practice of inter-marrying appears to have been too prevalent in early times to have admitted of suppression. To marry a woman of higher caste, and especially of a caste not immediately above one's own, is positively prohibited, the offspring of such a union being excluded from performing obsequies to his ancestors, and incapable of inheriting the parent's property. But, according to Manu, a man may marry a girl of any or each of the castes below his own, provided he has already a wife of his own class, since she only should perform the duties of personal attendance and religious observance devolving upon a married woman.

The self-exaltation of the highest class was due, not altogether to priestly arrogance and ambition, but, like a prominent feature in the post-Vedic belief—the transmigration

of souls—it was the natural consequence of the pantheistic doctrine. To the Brahmanical thinker, who saw in the numberless individuals of animate nature but so many manifestations of the one eternal soul, to a union with which they must all tend as their final goal of supreme bliss, the greater or less imperfection of the material form in which they were embodied naturally presented a continuous scale of spiritual units from the lowest degradation up to the absolute purity and perfection of the supreme spirit. To prevent one's sinking yet lower, and by degrees to raise one's self in this universal gradation, or, if possible, to attain the ultimate goal immediately from any state of corporeal existence, there was but one way—subjection of the senses, purity of life, and knowledge of the deity. As Manu's code concludes: "He who in his own soul perceives the supreme soul in all beings, and acquires equanimity towards them all, attains the highest state of bliss." The life marked out for the Brahmans by that stern theory of class duties which they themselves had marked out, and which must have been practiced in the early times, at least in some degree, was by no means one of ease and amenity. It was, on the contrary, well calculated to promote that complete mortification of the instincts of animal nature which they considered as indispensable to final deliverance from the revolution of bodily and personal existence.

The devoted Brahman who desired to obtain the utmost good upon the dissolution of his body, was enjoined to pass successively through four orders or stages of life, viz.: 1, that of religious student; 2, that of householder; 3, that of anchorite; 4, that of religious mendicant. Theoretically, this course was open and recommended to every twice-born man, his distinctive occupations being in that case restricted to the second condition, or that of married life. Practically, however, persons of the second and third castes were doubtless in general content to go through a term of studentship in order to obtain a certain amount of religious instruction before entering into the married state and performing their professional duties. In the case of the sacerdotal class, the practice was probably all but universal in early times; but gradually a more and more limited proportion seem to have carried their religious zeal to the length of self-mortification involved in the two final stages. When the youth had been invested with the sign of his caste, he was to reside for some time in the house of some religious teacher, well read in the Veda, to be instructed in the knowledge of the scriptures and the scientific treatises attached to them, in the social duties of his caste, and in the complicated system of purificatory and sacrificial rites. According to the number of Vedas he intended to study, the duration of the period of instruction was to be—probably in the case of Brahmanical students chiefly—of from 12 to 48 years; during which time the virtues of modesty, duty, temperance, and self-control were to be firmly implanted in his mind by unremitting observance of the most minute rules of conduct. During all this time the Brahman student had to subsist entirely on food obtained by begging from house to house; and his behavior towards the preceptor and his family was to be that prompted by respectful attachment and implicit obedience. In the case of girls no investiture takes place, the nuptial ceremony being considered an equivalent for that rite. On quitting the teacher's abode, the young man returns to his family and takes a wife. To die without leaving legitimate offspring, and especially a son to perform the periodical rite of obsequies to his father, is considered by the true Hindu a very great misfortune. There are three sacred debts which a man has to discharge in life: that which is due to the gods, of which he acquits himself by daily worship and sacrificial rites; that due to the ancient and inspired seers of the Vedic texts, discharged by the daily study of the scriptures; and the final debt which he owes to his *manes*, and of which he relieves himself by leaving a son. Some authorities add a fourth—the debt owing to human kind, which demands the practice of kindness and hospitality; hence the necessity of entering into the married state. When the husband leads the bride from her home to his own, the fire which has been used for the marriage ceremony goes with the new couple, to serve as their domestic fire; and it has to be kept up perpetually day and night, either by themselves or their children, or, if the man be a teacher, by his pupils. If it should become extinguished by neglect or otherwise, the guilt thereby incurred must be atoned for by an act of expiation. The domestic fire serves the family for preparing their food, for making the fire necessary daily for occasional offerings, and for performing sacramental rites. No food should be eaten that has not been duly consecrated by a portion of it being offered to the gods, the beings, and the *manes*. These three daily offerings are also called by the collective name of the sacrifice to all the deities. The remaining two are the offering to Brahma—that is, the daily lecture of the scriptures, accompanied by certain rites—and that to men, consisting in the entertainment of guests. The domestic observances, many of which must be considered as ancient Aryan family customs, surrounded by the Hindus with a certain amount of adventitious ceremonial, were generally performed by the householder himself, with the assistance of his wife. There is, however, another class of sacrificial ceremonies of a more pretentious and expensive kind, called srauta rites, or rites based on revelation, the performance of which, though not indispensable, was yet considered obligatory under certain circumstances. They formed a powerful weapon in the hands of the priesthood, and were one of the chief sources of their subsistence. Owing to the complicated nature of these sacrifices, and the great amount of ritualistic formulas and texts recited during their performance, they required the employment of a number of profes-

sional Brahmans, frequently as many as 16, who had to be well rewarded for their services. Priests who refuse money for their services are eulogized by Brahmanical writers; but such virtue was rare. The manuals of the Vaidak rituals generally enumerated three of these rites: *ishtis*, or oblations of milk, curds, clarified butter, rice, grain; annual offerings; and libations of *soma*. The soma, which is an intoxicating drink prepared from the juice of a kind of milk-weed, sometimes called the moon-plant, must have played an important part in the ancient worship, at least as early as the Indo-Persian period. It is continually alluded to both in the *Zend Avesta* and the *Rigveda*. In the latter work the hymns of a whole book are addressed to it, either in the shape of a mighty god, or in its original form, as a kind of ambrosia endowed with wonderfully exhilarating powers. In post-Vedic mythology *soma* has become identified with the lunar deity, to whom it seems to have had some relation from the beginning. Among the Vaidik rites the soma-sacrifices are the most solemn and complicated, and those to which the greatest efficacy is ascribed in remitting sin, conferring offspring and even immortality. They require the attendance of 16 priests, and are divided into three groups, according as the actual pressing and offering of the soma occupies only 1 day, or between 1 and 12 days. The performance of all srauta sacrifices require two other fires besides that used for domestic rites. The act of first placing the fires in their respective receptacles, after due consecration of the ground, constitutes the essential part of the first duty, which the householder should have performed by four Brahmans immediately after the wedding. To the same class of sacrificial ceremonies belong those performed on the days of the new and full moon, the oblation at the commencement of the three seasons, the offerings of first-fruits, and other periodical rites. Besides these regular sacrifices, the srauta ceremonial includes a number of most solemn rites, which, on account of the objects for which they are instituted, and the enormous expenditure they involve, could be performed only on rare occasions and by powerful princes. Of these the most important are the inaugural ceremony of a monarch who claims supreme rule, and the horse sacrifice, one of great antiquity, enjoined by the Brahmanical ritual upon kings desirous of attaining universal sovereignty. The efficacy ascribed to this ceremony in later times was so great that the performance of a hundred such sacrifices was considered to deprive Indra of his position as chief of the immortals.

When the householder is advanced in years, when he sees his skin become wrinkled and his hair gray, when he sees the son of his son, the time is said to have come for him to enter the third stage of life. He should now disengage himself from all family ties—except that his wife may accompany him if she choose—and repair to a lonely wood, taking with him his sacred fires and the implements required for the daily and periodical offering. Clad in a deer's skin, or in a single piece of cloth, or in a bark garment, with his hair and nails uncut, the hermit is to subsist exclusively on food growing wild in the forest, such as roots, green herbs, fruits, wild rice and grain. He must not accept gifts from any one, except of what may be absolutely necessary to maintain him; but with his own little hoard he should, on the contrary, honor to the best of his ability those who visit his hermitage. His time must be spent in reading the metaphysical treatises of the Veda, in making oblations, and in undergoing various kinds of privations and austerities, with a view to mortifying his passions and producing in his mind an entire indifference to worldly objects. Having by these means succeeded in overcoming all sensual affections and desires, and in acquiring perfect equanimity towards everything around him, the hermit has fitted himself for the final and most exalted order, that of the devotee or religious mendicant. As such he has no further need of either mortifications or religious observances; but "with the sacrificial fires reposited in his mind" he may devote the remainder of his days to meditating on the divinity. Taking up his abode at the foot of a tree in total solitude, "with no companion but his own soul," clad in a coarse garment, he should carefully avoid injuring any creature or giving offense to any human being that may happen to come near him. Once in a day, in the evening, "when the charcoal fire is extinguished and the smoke no longer issues from the fire-place, when the pestle is at rest, when the people have taken their meats and the dishes are removed," he should go near the habitations of men in order to beg the little food that may suffice to sustain his feeble frame. Ever pure of mind, he should thus bide his time, "as a servant expecteth his wages," wishing neither for death nor for life, until at last his soul is freed from its fetters and absorbed in the eternal spirit, the impersonal, self-existent Brahma.

The study of the ancient Hindu literature has taught us that some practices which have hitherto, or until recently, prevailed in India, and which have contributed much to bring Hindu morals into disrepute, are comparatively modern innovations. Thus, the rites of *sutte* (prop. *sati*, "the faithful wife") or the voluntary immolation of widows, which was abolished with considerable difficulty about 30 years ago, seems to have sprung up originally as a local habit among the Kshatriyas, and, on becoming more and more prevalent, to have at length received Brahmanical sanction. The alleged conformity of the rite to the Hindu scriptures has been shown to have rested chiefly on a misquotation, if not an intentional garbling, of a certain passage of the *Rigveda*, which, so far from authorizing the cremation of the widow, bids her return from the funeral rite to her home and resume her worldly duties. Cases of infanticide are still frequent in many parts of India, especially among the Rajputs; but the priests have never sanc-

tioned the practice. Its origin has to be sought in the enormous extravagances of wedding feasts, and in a notion that parents are disgraced by their daughters remaining husbandless. Hence, also, the practice of early marriage, which is the more mischievous as the Hindu law does not allow widows to marry. The cow has been held in high honor in India from early times; but the abhorrence of slaughtering and eating the flesh of kine is of late origin. It has been conclusively shown by a Hindu scholar that in former times beef formed a staple article of food. (For particulars and varieties of Hindu doctrines, etc., see INDIA, BUDDHISM, PARSEES, SIKHS, VEDA, MARUT, SURYA, USHAS, UPANISHAD, METEMPSYCHOSIS, VEDANTA, VAISHNAVAS, SAIVAS, SAKTAS.)

BRAHMAN, or BRAHMIN, the name of the highest caste (q.v.) in the system of Hinduism.

BRAHMANBE'RIA, a t. of India in the presidency of Bengal, division of Chittagong. It has sea and railway communication with Calcutta. Pop. '72, 12,364.

BRAHMAPU'TRA, a river which rises in Thibet, and, after partially mingling with the Ganges, flows into the bay of Bengal by three mouths. It is formed by the junction, in Assam, of two main branches—the Brahmaputra, from the n.e., and the Sampoo, from the n.w.; the entire length rather exceeds 900 m. from the one source, and 1700 from the other. The B. proper rises about lat. 28° 30′ n., and long. 97° 20′ e.; while the Sampoo springs from the same swamp as the Sutlej and the Indus. About 360 m. below their confluence, the B. leaves Assam, near Goulpara, and after 60 m. more in a s.w. direction, takes a sweep round the w. extremity of the Garrow mountains. In lat. 25° 10′ n., and long. 89° 43′ e., it throws off the Konaie, and after a course of 180 m. is named the Meghna. Ninety m. from the sea, it combines with the Ganges in cutting up their common delta into a net-work of inland navigation.

BRAHMIN OX. See ZEBU.

BRAHMO SOMAJ (*Theistic Church*) is a religious and social association in India, originated by the celebrated Hindu rajah, Rammohun Roy, in 1830, under the title, *Society of God*. The accession of Debendra Nath Tagore, a wealthy Calcutta Brahman, in 1842, gave the movement a great impetus, which was also much aided by the spread of English education. Its latest and most advanced development took place under Keshub Chunder Sen, who joined it in 1858, and whose visit to Europe in 1870 created so much interest. It has been Sen's aim to apply the principles of the church to practical life, and under his leadership the progressive party have seceded from the original church, and assumed the title of "Bramo Somaj of India." Their fundamental principles are that there is but one supreme God, the object of worship; that nature and intuition are the sources whence our knowledge of God is derived; and that religion admits of progressive development. They ignore all distinctions of caste, and consider all men as God's children; they abjure all idolatrous rites, and acknowledge no sacred books or places, but value what is good and true in all religions, and recognize the necessity of public worship. They have about 100 branches throughout India, and maintain two periodicals and several schools.

BRAIN is the nervous center in which reside consciousness and power over the voluntary movements of the body. It consists of one or more masses of *gray* and *white* nervous matter, or what are technically called vesicular and tubular neurine. When these substances are blended together, the mass is termed a *ganglion*, and from it proceed prolongations of the tubular matter, which are called nerves, and are conductors of impressions to or from the the vesicular neurine. The number and size of these ganglia vary with the powers of the animal. In the lowest forms of mullusk, we find a single ganglion from which proceed all the nerves of the animal; in the higher, there are two ganglia, joined by a nervous cord round the gullet, and distinct from, though connected with, the ganglion which supplies nerves to the foot, and the one for the respiratory apparatus. In the common slug, we have these cephalic ganglia united so as to form one bilobed mass of B. above the œsophagus.

In the ARTICULATED ANIMALS (q.v.), the B. consists of two cephalic ganglia over the œsophagus; there are also two nervous cords, one on each side of the body connected with each other. In the *cephalopoda*, as the pearly nautilus, the B., or mass of nervous matter situated over the gullet, is a transverse *cord*-like ganglion; in the cuttle-fish (*sepia officinalis*) we find a distinct rounded mass, supported by a rudimentary skeleton. In FISHES, we find, instead of one supra-œsophageal mass or ganglion, several separate masses, the nerves ending in their own special ganglia; i.e., where each nerve ends or begins in the B., there is a collection of vesicular neurine. In addition to these ganglia in fishes, there are parts corresponding to the cerebral lobes or hemispheres of the human brain. There is also a cerebellum.

Suppose we examine a cod's brain. Removing the roof of the skull, we see three pair of neurine masses; two small and round in front, the hemispherical ganglia; two larger in the middle, the *optic* ganglia; and a little triangular appendage behind, the cerebellum. From just in front of the anterior of those three pairs of masses diverge nervous prolongations, which end in two bodies, called the *olfactory* ganglia. On lifting the appendage we have named cerebellum, we see on each side of the spinal cord a deposition of neurine, which represents the *auditory* ganglia of more fully developed

brains. The olfactory ganglia vary in their distance from the general mass. In REPTILIA, they are placed very near the cerebral hemispheres, which are small, as is also the cerebellum. But when we reach the BIRDS, the size of the cerebral lobe, in proportion to all the other parts, is much increased, so that they overlay the different ganglia, which are not placed one in front of the other, as in fishes and reptiles, but packed one above the other. We now begin to find some indications of *convolutions*. On the surface of the B. in the parroquet, Leuret describes the furrowing as distinct, though many birds have perfectly smooth hemispheres; these also are not hollow, as in fishes and reptiles; and it will be seen that the convoluting or folding of the B. substance backwards and forwards, must allow of more being packed into the space than could be admitted by any other arrangement. The middle part of the cerebellum is very large, and divided into laminæ or leaflets; its lateral portions are much smaller than in mammalia: the olfactory ganglia are small, and close to the cerebral hemispheres. The optic ganglia and other nerves rising from them are very large, and the wedge-shaped portion, called *medulla-oblongata*, connecting the B. with the spinal cord, is also large. We now approach the MAMMALIA, and in the *monotremata*, which in some important respects resemble birds—the *ornithorhynchus paradoxus*, for instance—we find small smooth hemispheres in a B. which to the whole body bears only the proportion of 1 to 130. Even this is greater than in the marsupials; the kangaroo's B. is as 1 to 800.

If we examine a rabbit's B., we find it to consist, apparently, of three parts—the *olfactory bulb*, the *cerebral hemispheres*, and the *cerebellum*. The cerebral hemispheres are connected by a transverse band of union, or what is technically termed a *commissure*. Continuing the dissection, we turn aside the hemispheres, and find they have concealed *four ganglia*, which represent the single pair of optic ganglia we found in birds. There are two other bodies in front of those just alluded to—viz., the *optic thalamus*, and in front of it another (inferior) *longitudinal commissure*. This forms a communication between the anterior and posterior portions of the hemisphere, on the same side. Two little white lines, running from the back of the thalami, join a little body called the *pineal gland*, interesting in connection with some fantastic physiological theories. It will be observed that the hemispheres lie over these structures like a cap; the space between the two, on each side, is termed the *lateral ventricle*.

We have now the most complicated B. before us, the human encephalic mass of ganglia, and include with it the *medulla oblongata*, the link which unites the B. to the spinal cord. First viewing the B. from its upper surface, we see that it is divided by the longitudinal fissure into two equal halves or hemispheres, which are broader behind than in front. They are irregularly marked by convolutions, and a smooth appearance is given to the whole surface by the glistening arachnoid membrane (q.v.). On slicing them transversely with a knife, the section appears white in the center, and gray at the margins, of the *convolutions*, which are now seen penetrating to various depths below the surface. The white substance is dotted with the blood-vessels which supply the brain. On drawing the hemispheres asunder from each other with the fingers, the great commissure, or uniting band, is seen, the *corpus callosum*, which is streaked both longitudinally and transversely. The hemispheres should now be completely sliced off on a level with this commissure, and its transverse fibers will be seen to extend into their substance, constituting a large white surface, called by anatomists the *white oval center*.

If we take the handle of the knife, and scratch with it through this white substance, the instrument soon opens a cavity, which is the *lateral ventricle*. Let this be done on both sides, and the ventricles exposed to view. They are shaped somewhat like the italic *S*. Their extremities are termed cornua, and the anterior look from each other, and are nearer than the posterior, which are turned the opposite way. We have now removed the hemispherical ganglion, and uncovered the others. The pia mater, which supports the vessels bringing blood to the B. substance, is seen in a purple wreath lying in each ventricle, and passing down into a depression termed the *middle horn* of the ventricle. This is the *choroid plexus*, and, if lifted, it will be found continuous with that on the opposite side, through an aperture called the foramen of Monro, after the great Scotch anatomist of that name. If the remains of the corpus callosum are now scraped away, the choroid plexus will be found continuous with a web of pia mater called the *velum interpositum*, which lies over the central cavity of the B., or third ventricle. In front and behind will be seen portions of the inferior longitudinal commissure or *fornix*, the body of which has been removed to show the velum; but, placed vertically between its anterior part and the under surface of the corpus callosum, are two layers of gray matter, between which is a narrow space termed the *fifth ventricle*. Behind, there will be seen a small hole, through which a probe will pass into the *fourth ventricle*.

We now come to the upper surface of the *cerebellum*, consisting of two hemispheres split transversely into leaflets, and connected by a central portion to each other, and by two bundles of white fibers to the corpora quadrigemina. Between these is the *fourth ventricle;* and stretched across between them is a thin layer of gray matter, called the *valve of Vieussens*.

We now turn what remains of the B. upside down, and examine the base or under surface. It is very irregular in outline. The cerebral hemispheres are now found to be divided on each side by a *fissure* (*Sylvian*). The part in front is called the

anterior lobe; that behind the *middle,* as far as the cerebellum, when it is called the *posterior lobe.*

The olfactory lobes are now seen lying in a fissure in the anterior lobes. The optic tracts are seen meeting at their commissure, interchanging fibers, and passing on as the optic nerves to the orbit. The larger bundles behind, and directed outwards, are the *crura cerebri,* passing towards the hemispheres, emerging from the transverse mass called the *pons varolii,* which lies like a clamp between the two halves of the cerebellum. From the inner side of each crus arises the third nerve, destined to supply four of the muscles which move the eyeball. The fourth nerve comes from the valve of Vieussens, and is seen on its way to supply the superior oblique muscle which turns the eye upwards and outwards, hence called *patheticus.* From each side of the pons the fifth pair arises; the sixth, between the pons and the anterior pyramids of the medulla oblongata; the eighth, consisting of: 1. The glosso-pharyngeal, or nerve of deglutition. 2. The pneumogastric distributed to the respiratory apparatus and stomach; and with it, 3. The spinal accessory.

The chemical composition of B. matter averages in 100 parts—

Water	
Albuminous matter	75½ parts.
Fat	7 "
Salts (containing 1½ of phosphoric acid)	11½ "
	6 "

The proportion of these constituents varies not only in different species of animals, but also in different members of the same animal group, and appears to be much influenced by the age, temper, and intellectual capabilities of each individual. Thus, the normal quantity of salts in the B. of a healthy man is 6 per cent, and in the B. of an insane patient, only 2¼ per cent were found.

Softening of the brain (ramollissement) is a frequent result of chronic inflammation of the brain. The patient has been for some time in low health, troubled with headaches, loss of appetite, depression of spirits, and a gradual loss of memory, and acute perception of things in general. Then a spasm may occur, followed by paralysis, or the legs and arms may be bent up, and remain in that position. This condition of B. may be caused by want of proper nourishment to the cerebral substance, owing to plugging up, or from disease of its arteries. When the softening is caused by inflammation, we frequently find pus forming an abscess of the brain. Induration may also occur as the result of inflammation.—The other diseases, as hydrocephalus, will be treated under their own names.

Diseases of the brain.—Inflammation (acute) of the B. (*phrenitis,* or popularly, *brain fever*) rarely occurs separately, and can scarcely be distinguished from inflammation of its membranes (meningitis). According to Dr. Watson of London, when the disease begins in the latter, the first remarkable symptom is a convulsion fit; when in the B. substance itself, nausea and vomiting generally usher in the attack.

In the first stage, there is rapid pulse, severe headache, the eyes suffused, and their pupils contracted to a small point, very intolerant of light. The patient is constantly watchful, and much annoyed by even ordinary sounds. Then furious delirium sets in, and lasts for a period, varying with the case, generally from twelve to forty-eight hours; when it is succeeded by collapse, in which the patient lies—his face devoid of color, and covered with cold sweat—in a state of stupor. If roused, he now speaks with slow, indistinct utterance; his pupils are now dilated, and indifferent to the brightest light; and the loudest speaking ceases to annoy him. The stupor increases with the general prostration, and continues till death. After death, we find serous fluid upon and in the B., deposits of lymph, thickening of the membranes, and softening of the B. substance itself.

General and local bleeding, with antimony and digitalis, to subdue the pulse; mercury, to prevent the deposit of lymph; blisters, as counter-irritants, to the back of the head and neck, are the usual remedies for this rare, but terrible disease. The younger school of practitioners, however, as Dr. Tanner expresses it, prefer waiting to see if nature unaided, or only *gently guided,* will not carry the patient through a disease where the efforts of art are notoriously futile, and are rather content to *watch the symptoms,* to calm excitement by sedatives, to lessen increased heat of body by diluents and tepid sponging, to prevent accumulations in the intestines by purgatives, and to diminish maniacal delirium by the application of cold to the head.

BRAIN, DISEASES OF THE, are comprehended in six general classes, viz.: 1. Cerebral congestion; 2. cerebral anæmia; 3. cerebral hemorrhage; 4. inflammatory diseases; 5. structural lesions; 6. functional disturbances. Active congestion of the B. is a well-known and dangerous disease; but may often be removed by proper treatment. Cold applied to the head, and warm stimulating applications to the extremities, are very useful. Passive congestion is marked by a livid face, dull pains, sluggishness of the mental faculties, and disturbed sleep. Cerebral anæmia includes diseases arising from impoverished or otherwise disordered blood, and is marked by frequent fainting, paleness of the face, and gasping as if actually dying. The natural remedies are to stimulate the action of the heart so as to increase the flow of blood to the head, and placing the body in a horizontal position, with the head lowest. Dashing cold water into the face will

often excite the heart to the required action. There are many other forms of anæmia, general or partial. Cerebral hemorrhage, or bleeding in the substance or between the parts of the brain, is generally a consequence of disease of the arteries of the B., and is often developed in apoplexy or hemiplegia. In attacks of apoplexy dependent upon extravasation of blood, the body should be kept quiet, with the head raised, applying cold water or ice thereto, and removing all articles of clothing that may press upon the neck or chest. It should be known that cerebral hemorrhage is seldom preceded by symptoms; hence, in general, ringing in the ears, dizziness, and other symptoms which some fear to be indicative of an apoplectic attacks are really not so. Inflammatory affections of the brain are seated either in the membranes or the cerebral substance, oftenest in the former. They are generally included in the term meningitis, which is acute, subacute, or chronic, and there is a tuberculous variety. The causes in cases not arising from actual injury to the head, are generally excessive use of alcoholic liquors, or exposure to severe heat. This form of development occurs chiefly in adults. Children are oftener subject to acute inflammation in the course of measles, scarlet fever, or erysipelas. The leading local symptoms of acute meningitis are pain in the head, a flushing of the face, intolerance of loud sounds and strong light, increased sensibility of the surface of the body, throbbing of the arteries in the neck and head, and delirium which is often violent and accompanied with hallucinations. There is usually fever, and sometimes there are convulsions. In the second stage there is heavy sleepiness ending in coma, paralysis of some of the facial muscles or of the limbs on one side, dilatation of the pupils, and irregular pulse; symptoms that betoken speedy death. A very large proportion of cases of simple acute meningitis end fatally, sometimes almost immediately or within a few hours, but occasionally a week may intervene. Treatment should be directed by a physician. When acute cerebral meningitis affects the membranes of the spinal cord, it is not only extremely fatal but is epidemic. There are other varieties of more or less importance that can be understood only by professional men, and, as a matter of safety, all brain affections should be dealt with under the direction of a physician. The same must be said of lesions affecting the structure of the brain, too many and various to describe; and to these must be added functional diseases which produce mania, monomania, melancholia, dementia, etc.

BRAINARD, JOHN GARDINER CALKINS, 1796–1828; b. Conn.; a graduate of Yale; editor of a newspaper in Hartford, in which he published many pieces of verse. After his death a volume of his poems was published, and a third edition was issued in 1832, with a memoir by John G. Whittier. B. ranks high in class next below the greatest American poets.

BRAINE-LE-COMTE, a busy t. of the province of Hainault, Belgium, about 13 m. n.n.e. of Mons. It is an ancient place, and formerly belonged to the monks of St. Waudru at Mons, from whom it was bought by count Baldwin in 1158. It has an old church of the 13th c.; and cotton and corn mills, dye-works, breweries, etc. Some of the finest flax that can be produced is grown in the district. Pop. '70, about 6400.

BRAINERD, DAVID, 1718–47; an American missionary, b. Conn. His missionary work was among the Indians in Massachusetts and those around the Delaware and Susquehanna rivers. President Edwards wrote his biography, and that and B.'s journals are well known. B. was a man of strong mental powers, extensive knowledge, great sagacity, and fervent zeal, and as a preacher he was forcible and pathetic.

BRAINSTONE CORAL, the popular name of certain kinds of coral (q.v.) or madrepore (q.v.), included in the Linnæan genus *madrepora*, but now forming the much more restricted genus *meandrina*. They derive their name from the general resemblance to the brain of man or of a quadruped exhibited in their large rounded mass, and numerous winding depressions. Perhaps the true B. C. is *meandrina cerebriformis*, a species always nearly hemispherical. When the hemispherical mass is broken, the ridges which bound its furrows may be traced inwards through its substance, even to the central nucleus from which they commenced. The mouths of the polypes, in all the species of this genus, are in the furrows or elongated hollows, in which they are ranged side by side, in sinuous series. The brainstone corals are very common in collections, and are much admired for their beauty. They are found chiefly in the seas of warm climates, particularly in the Indian and s. Atlantic oceans. They sometimes attain a large size. Ehrenberg noticed single masses (polypidoms) in the Red sea, from 6 to 9 ft. in diameter. Their rate of growth, however, appears to be slow. The fossil species are few, and chiefly belong to the oolitic formation.

BRAINTREE, a t. in Norfolk co., Mass., 10 m. s. of Boston, on the Old Colony, Newport and Southside railroads; pop. '70, 3948; in '80, 3856; a manufacturing place for boots and shoes, linen, woolen, paper, machinery, etc. The town of Quincy was formerly included in Braintree.

BRAINTREE, a market-town of Essex, about 40 m. n.e. from London. It is an old place, having been constituted a market-town by king John. Its streets are narrow, and many of its houses are of wood. It has manufactures of silk, crape, and straw-plait. It is one of the polling-places for n. Essex, and has obtained some notoriety in connection with political and ecclesiastical proceedings. Pop. of parish, '71, 4790.

BRAIZE, or BECKER, *Pagrus vulgaris*, the fish popularly called the porgie, or scup; a common and good table-fish.

BRAKE, a genus of ferns of the division *polypodeæ*, distinguished by spore-cases in marginal lines covered by the reflexed margin of the frond. The COMMON B. or BRACKEN (*P. aquilina*) is very abundant in Britain and in most parts of the continent of Europe, growing in heaths, parks, etc., often covering considerable tracts. It is a widely distributed plant, and is found in many parts of Asia, and in some parts of Africa. It has a long, creeping, black rhizome, or root-stock, from which grow up naked stalks of 8 to 18 in. in height; each stalk divides at top into three branches; the branches are bipinnate, the inferior pinnules pinnatifid. The root-stock, when cut across, exhibits an appearance which has been supposed to resemble a spread eagle, whence the specific name *aquilina* (Lat. *aquila*, an eagle). The root-stock is bitter, and has been used as a substitute for hops; it has also been ground, mixed with barley, and made into a wretched bread in times of distress. The plant is astringent and anthelmintic; and as such, it had at one time a high reputation, although it is now little used, at least by medical practitioners. It is employed in dressing kid and chamois leather. The ashes, containing a large quantity of alkali, were formerly used in the manufacture of soap and of glass, so that the collecting of them for sale was a considerable resource of the poor in some parts of the Hebrides. B. is also employed for thatching, for littering cattle, etc., and occasionally chopped up with straw or hay, for feeding cattle. It is a favorite covert of deer and other game. The abundance of this plant is sometimes regarded as a sign of poor land, although, probably, its absence from the richer soils is very much a result of cultivation. To extirpate it, nothing more is necessary than a few successive mowings of the young shoots as they appear. The annual growth of B. is killed by the first frosts of autumn, but remains rigid and brown, still affording shelter to game, and almost as characteristic a feature in the landscape of winter as in that of summer, perhaps adding to its general desolateness.—*Pteris caudata*, a large species of B. very similar to that of Europe, is one of the worst pests which the farmer has to contend with in the s. of Brazil.—*Pteris esculenta*, a native of New Zealand, Van Diemen's Land, etc., has a more nutritious rhizome than the common brake. See TARA FERN.—Rock B. (*cryptogamma crispa* or *allosorus crispus*, formerly *pteris crispa*) is a pretty little fern, common on stony hills in the northern parts of Britain.

BRAKE, a contrivance to stop motion by friction, applied mainly to car wheels and hoisting apparatus. Originally it was a flexible iron band so placed that it might be drawn tightly around most of the outer surface of the revolving wheel, the friction gradually slackening the motion. In carriages curved blocks of wood were used, and pressed against the tire by a lever worked with the hand or the foot. Modern invention has given us systems of brakes that may be instantly applied to every wheel in a train of cars. For the Creamer brake, once somewhat in favor, a powerful spiral spring was the power applied. This spring was coiled in a drum through which a shaft passes, and was set free by the brakeman, or all the brakes on a train could be set free by one act of the engineer. The Westinghouse air-brake is now very generally used in America. Each carriage has beneath its floor a cylinder and piston which may be operated by compressed air; the piston acts on suitable levers and rods to set the brakes against the wheels, the brakes being also connected with the ordinary braking mechanism at the platform of the cars. Compressed air is conveyed to the cylinders by tubes leading from a reservoir at the locomotive, and this reservoir is filled by a special engine which is independent of the ordinary motive mechanism. The special engine acts automatically, starting when the pressure of air in the reservoir is below a fixed standard, and stopping when the pressure reaches another fixed standard. The engine-driver communicates the compressed air to the cylinders by the simple act of turning a valve-handle through one fourth of a circumference; the brakes are instantly "set" with great force throughout the train. A different system uses a vacuum, and the pistons beneath the cars are acted on by atmospheric pressure, when the cylinders are in communication with the vacuous reservoir. The Westinghouse and the other air brakes serve to place the train very fully under the control of the engine-driver; permitting the stoppage of trains from high speed in a very short space.

BRAMA, a genus of fishes of the family *chætodontidæ* (q.v.). *B. raii* is common in the Mediterranean, and occasionally found on the British shores. It is one of the fishes to which the name bream (q.v.) or sea-bream has been given; and it has also been described as a gilt-head (q.v.); but these names belong to fishes of other families, with some similarity of general appearance. The genus B. has the body very deep and compressed, the head rather obtusely terminated, a single elongated dorsal fin, and the anal fin with a very lengthened base. The tail is forked, its points extremely divergent. This fish is sometimes more than 2 ft. in length. Its flesh is of exquisite flavor.

BRAMAH, JOSEPH, an eminent practical machinist, the son of a farmer, was born at Stainborough, Yorkshire, April 13, 1749, and early exhibited an unusual talent for mechanics. Incapacitated in his 16th year from agricultural labors by an accidental lameness, he was apprenticed to a carpenter and joiner, and afterwards obtained employment with a cabinet-maker in London. Subsequently, he established himself in business in the metropolis, and became distinguished for the number, value, and inge-

nuity of his mechanical inventions, such as safety-locks, improvements in pumps and fire-engines, in the construction of boilers for steam-engines, in the processes of making paper, in the construction of main-pipes, wheel-carriages, the beer-machine used at the bar of public-houses, and many others. About 1800, he constructed the hydrostatic press known by his name. See HYDRAULIC PRESS. In all, he took out about twenty patents. He died 9th Dec., 1814.

BRAMANTE, DONATO LAZZARI, one of the most celebrated Italian architects, and also distinguished as a painter, was born at Monte-Asdroaldo, in the duchy of Urbino, 1444. From 1476–99, he resided in Milan, where he studied geometry and perspective, neither of which sciences was well understood by artists in his day. He was noted as one of the best painters in Lombardy; but his success in architecture eclipsed his fame as a painter. In Milan, he built the choir of Santa-Maria delle Grazie, and the church of Santa-Maria presso San-Satiro. After the fall of Ludovico Sforza, B. went to Rome, where he wast first employed by the pope Alexander VI., and afterwards by Julius II. The first great work which he undertook for the latter was to connect the Vatican palace with the two pavilions of the Belvedere by a series of immense galleries; the second was the rebuilding of St. Peter's church, of which he laid the new foundation in 1506. When only a small portion of his plans had been realized, B. died at Rome, 1514, and succeeding architects departed widely from the original design of a grand cupola over a Greek cross. Among other works of B. in Rome may be mentioned the palaces Cancellaria and Giraud (now Torlonia), in which he adhered more strictly than in other works to antique forms, but not without a characteristic grace in his application of these.

BRAMBANAN', a district of the province of Soorakarta, Java, rich in remains of Brahmanical temples, which are superior in magnificence to any in India. The edifices are composed entirely of hewn stone, and no mortar has been used in their construction. In all, there are 296 temples, disposed in five parallelograms, one within the other. The outer one consists of 84 temples; the second, of 76; the third, of 64; the fourth, of 44; and the inner one, of 28. In the center stands the largest and most imposing structure of all. It is 90 ft. high, and profusely decorated with mythological figures, which are executed in a very fair style of art. On the s. face of the outside parallelogram, there are two monstrous figures, with uplifted clubs, kneeling in a threatening attitude. The great temple is pretty entire, as are also about a third of the others, but the rest lie strewn upon the ground.

BRAMBLE, *Rubus fruticosus*, a plant common in Britain and most parts of Europe, having prickly stems, which somewhat resemble those of the raspberry (q.v.). The flowers do not appear till the summer is considerably advanced, and the fruit ripens towards the end of it, continuing to be produced till the frosts of winter set in. The fruit (brambleberry or blackberry) is too well known to need description. Besides affording much enjoyment to children, who collect it from hedges and thickets, it is sometimes offered for sale in towns, and jelly and jam are prepared from it of very delicate flavor, besides a wine, which, both in strength and flavor, is held by many to excel all products of similar native fruits of Britain. The B. is rarely cultivated, perhaps because it is in most districts so abundant in a wild state; but it seems to deserve attention at least as much as the raspberry, and might probably be as much improved by cultivation. A slight rail on each side of a row of brambles, to restrain the straggling stems, affords the necessary security for neatness and order, and the care bestowed is repaid by abundance of fruit, very acceptable where wild-brambles are not plentiful, and at a season when there is no other small fruit in the garden.—There are many different species of B., according to some—varieties according to other—botanists, to which the name is indiscriminately given, and which may almost all be regarded as belonging to the Linnæan *rubus fruticosus*. From this was separated *R. corylifolius* of Smith, a common British plant, and from these some German and British botanists have separated many other alleged species. *R. suberectus* has more the habit of the raspberry than most of the other kinds, but even its claims to be received as a species are not admitted without doubt by some of the most eminent botanists. A variety of B. with white fruit is occasionally met with.—Species of *rubus* very similar to the common B., or varieties of it, abound in the northern parts of Asia, the Himalaya mountains, and North America. See RUBUS.

BRAMBLING, BRAMBLE FINCH, or MOUNTAIN FINCH, *Fringilla montifringilla* (see FINCH and FRINGILLIDÆ), a bird nearly allied to the chaffinch (q.v.). It is a little larger than the chaffinch, which it much resembles in its general appearance, its bill, and even the disposal of its colors. The tail is more forked. In the males, the crown of the head, the cheeks, the back and sides of the neck, and the upper part of the back, are mottled in winter with brown and black; but in spring, the whole of these parts become of a rich velvety black; the throat and breast are of a rich fawn color, which is also the prevailing color of the wings, but they are crossed, when closed, by an oblique band of jet-black, and by another oblique band of white. The quill-feathers are also black, edged with yellow on their outer webs; the tail-feathers black, edged with reddish white; the rump and the belly are white; a small tuft of feathers under each wing and some of the lower wing-coverts are bright yellow. The B. is a mere winter visitant in Britain,

and the period of its arrival appears to vary according to the severity or mildness of the weather in the more northerly regions. The B. has never been known to breed in any part of the British islands, and even in the s. of Sweden it is a mere winter visitant. It breeds in the more northerly parts of Scandinavia. It has no song, its call-note is a single monotonous chirp. It is a very widely distributed species, being found as far e. as Japan, and, in its winter migrations, visiting Italy, Sicily, Malta, Smyrna, etc.

BRAMPTON, a very ancient t. in the co. of Cumberland, near the Arthing, 8 m. e.n.e. of Carlisle. It is surrounded by hills; and the Castle-hill commands a very extensive view. Pop. '71, 2617. The chief manufacture is the weaving of checks and ginghams; and there are coal-mines in the vicinity. On a rock, 2 m. to the s., is a Roman inscription, supposed to have been cut by one of Agricola's legions in 207 A.D. Two miles to the e. stands Lanercost abbey, founded in 1116.

BRAN is the material obtained from the outer covering or husk of grain during the process of grinding, and which is separated from the finer flour before the latter is made into bread (q.v.). It is generally met with in commerce in thin scaly yellowish-brown particles, with sharp edges, and its composition in 100 parts is as follows:

Water	13.1
Albumen (coagulated)	19.3
Oil	4.7
Husk, with a little starch	55.6
Ash or saline matter	7.3
	100.0

Bread made of flour, containing B., is known as *brown bread*. See BREAD. The main uses to which B. is put are in the feeding of horses and cattle, and poultry, and in clearing and brightening goods during the processes of dyeing (q.v.) and calico-printing (q.v.). In the practice of medicine, B. is employed as a warm poultice in abdominal inflammation, spasms, etc., and an infusion is used as an emollient footbath. It is also used internally in catarrhal affections.

BRANCALEO'NE, DANDOLO, d. 1258; a Ghibelline senator of Bologna, famous for his firmness in restoring order in a lawless period. He executed leading men of the most powerful families, and destroyed the strongholds of disturbers of the peace, checked the power of the church and the nobles, and with the strong hand suppressed public robbery. Yet he was deposed and arrested, and was in danger of execution; but he held hostages of the great families and was restored to power. His death was greatly lamented, and it was reported that "his head, inclosed in a costly vase, was deposited in a lofty column of marble."

BRANCH, in botany, is a part of a tree or other plant not taking its rise immediately from the root, but rather forming a sort of division of the stem, and which is often divided into secondary branches, again, perhaps, to be further much ramified into *branchlets* and twigs, the ultimate ramifications producing leaves, flowers, and fruit. Branches originate in leaf-buds, which are produced at the *nodes* of the stem, or of the already existing bran ches. See BUD, PLANT, and STEM. The buds being formed in the axils of leaves, the arrangement of the branches, as alternate, opposite, whorled, etc., varies like that of the leaves, but buds often remain dormant, according to a regular law of alternation. The angles of ramification are very different in different plants, producing great variety of appearance, and giving marked characteristics to different kinds of trees. The great difference between the ramification of the *coniferæ* in general (pines and firs) and that of other trees must have attracted the attention of every one. In many herbaceous plants whose axis is scarcely developed into a stem, instead of branches there proceed from the lateral buds *runners*, which lie close to the ground, send down roots, and produce new plants, as in the strawberry.

BRANCH, a co. in s. Michigan, on the Indiana border; 578 sq.m.; pop. '80, 27,941; undulating surface, with forests and oak-openings; fertile, producing the usual agricultural crops. There is iron in some places. The railroads are the Michigan Central and Fort Wayne, and the Jackson and Saginaw. Co. seat, Coldwater.

BRANCHIÆ. See GILLS.

BRANCHIOP'ODA (Gr. gill-footed), an order of *crustacea* (q.v.) of the division *entomostraca* (q.v.) deriving this name from the distinctive peculiarity of having the *branchiæ*, or gills, which are numerous, attached to the feet. They are all small creatures, many of them almost microscopic, and chiefly abound in stagnant fresh waters. Some are popularly known by the name of water-fleas (q.v.); the brine-shrimp (q.v.) is another example; and the genera *cyclops* and *cypris* may be mentioned, the former on account of its great frequency in stagnant fresh waters, the latter because its hard shells resist decomposition, and are therefore abundant in a fossil state.

BRANCO, RIO, a river of that portion of Brazil which, originally comprised within the understood limits of Guiana, lies to the n. of the Amazon. It rises in the Parime mountains, on the very borders of Venezuela; and after a southerly course of about 400

m., it joins, near lat. 1° 20′ s., and long. 62° w., the Rio Negro, of which it is the principal tributary, on its way to the Amazon.

BRANCURSINE. See ACANTHUS.

BRAND, a name given in some parts of Britain to some of those diseases of plants, especially of corn-plants, which are also called BLIGHT, BUNT, MILDEW, RUST, and SMUT.—See these heads.—It is the German name for the disease generally known in Britain as BUNT, and sometimes as *pepper-brand.* Both as a German and an English word, it appears to be derived from the verb *brennen,* to burn, and to refer to the burnt appearance which characterizes the diseases to which it is applied.—Its most common application in Britain, however, is not to any of the diseases already mentioned, but to a peculiar spotted and burnt appearance often seen on the leaves, and sometimes also on the bark of plants, which does not seem to be in any way connected with the presence of parasitic fungi, but which sometimes becomes so extensive as to cause the death of the plant. The nature of this disease is still somewhat obscure. Occurring most frequently when warm sunshine succeeds to moist weather or to hoar-frost, and frequently affecting plants in hot-beds upon which drops of condensed moisture fall from the frame, it has been ascribed to the concentration of the sun's rays by the drops of water on the leaf or bark—a theory utterly untenable, as no concentration can take place in such circumstances. The probability appears to be, that the action of the moisture unequally distributed, and particularly when sudden changes of temperature take place, deranges the vegetable functions, and destroys the fine tissues.—BRAND, a mark made on a cask for trade or excise purposes. See FISHERIES and TRADE-MARKS.

BRANDE, WILLIAM THOMAS, 1788–1866; an English chemist. He studied medicine, became a fellow of the royal society, and assistant to sir Humphrey Davy, succeeding him in the chair of chemistry in 1813. From 1816 to 1836 he and Faraday were joint editors of the *Quarterly Journal of Science and Art,* and in 1853 he received the honorary degree of D.C.L. of Oxford. B. was the author of several books on chemistry; but his fame rests chiefly upon his *Dictionary of Science, Literature, and Art,* a very useful work.

BRANDENBURG, a province of Prussia, in the center of the kingdom, in lat. 51° 30′ to 53° 45′ n., long. 11° 13′ to 16° 8′ e. B. has an area of 15,350 sq.m.; pop. '71, 2,863,229; '75, 3,132,483. It formed the nucleus of the Prussian monarchy, but the modern province does not quite correspond with the old *Mark* of B., which included also a part of the province of Saxony and of Pomerania, while it lacked certain small portions of territory now contained in the province of Brandenburg. Almost the whole province is a plain, so low that at Potsdam the surface of the river Havel is only 14.6 Prussian or about 15 English ft. above the level of the sea. The ground becomes slightly hilly towards Silesia. In general, the soil is sandy and naturally unfruitful. Without its numerous rivers and canals, B. would be one of the most barren tracts on the continent. The inhabitants are mostly Germans, mixed with French and Dutch colonists, who, however, are almost completely Germanized; and in the s. of the province, with people of Wend extraction. With the exception of 87,000 Roman Catholics, and 41,000 Jews they belong to the Protestant church. Agriculture and the rearing of cattle afford occupation for a considerable number of the inhabitants. The manufactures are silk, cotton, wool, linen, sugar, leather, paper, metals, etc. There are also numerous distilleries throughout the province. B. is divided into the governments of Potsdam and Frankfurt—Berlin, which is the capital forming a separate jurisdiction. In the beginning of the Christian era, B. was inhabited by the Suevi and afterwards by Slavonic tribes. It was subjugated by Charlemagne in 789, but it again acquired independence under his weak successors, and remained free until 928, when Henry I. possessed himself of it. After passing through numerous changes in connection with the general history of the German empire—of which we need here mention only the facts that Albert the bear (q.v.) became the first markgraf of B. in 1142, and Frederick of Nürnberg the first elector in 1417—it became associated with the rise of the Prussian state into a monarchy under Frederick I., elector of Brandenburg, in 1701. See PRUSSIA.

BRANDENBURG (the ancient *Brennaborch* or *Brennabor*), the t. from which the province Brandenburg is named, is situated on the line of the Berlin and Magdeburg railway, about 37 m. w.s.w. of Berlin. The river Havel divides it into two parts, Old and New B., which are both surrounded with walls. On an island in the river there is a third quarter, containing the castle, cathedral, equestrian college, etc. The cathedral has a fine old crypt, and several interesting antiquities. The inhabitants, amounting in 1875 to 27,371, inclusive of the garrison, are engaged in the manufacture of woolen, linen, hosiery, paper, leather, beer, etc. Boat-building is also carried on to a considerable extent.

BRANDENBURG, NEW, a walled t. in the grand duchy of Mecklenburg-Strelitz, n. Germany, is situated near the n. end of lake Tollen, about 50 m. w.n.w. of Stettin. It is a beautiful town, with regular, broad, and well-built streets. The grand duke has a palace in the market-place. It has manufactures of woolen, cotton, damasks, leather, paper, tobacco, etc., besides corn-mills, oil-works, and a trade in hides and horses, and is altogether a very thriving place. Pop. '75, 7495.

BRANDENBURG, CONFESSION OF, a confession of faith prepared by order of the elector of Brandenburg, with a view of reconciling the tenets of Luther with those of Calvin, and to terminate the disputes provoked by the Augsburg confession.

BRANDING was a mode of punishment practiced in England for various offenses. It was effected by the application of a hot iron, the end of which had the form which it was desired should be left imprinted on the skin. But B. by such means has long ceased, and now it is practically confined to the case of desertion from the army—the B. or marking being not done by a hot iron, but with ink, or other similar preparation. By the mutiny act of 1858, 21 Vict. c. 9, it is enacted by section 35 as follows: "On the first, and on every subsequent conviction for desertion, the court-martial, in addition to any other punishment, may order the offender to be marked on the left side, two inches below the arm-pit, with the letter D., such letter not to be less than an inch long, and to be marked upon the skin with some ink or gunpowder, or other preparation, so as to be visible and conspicuous, and not liable to be obliterated." Formerly, B. was employed in the case of all *clergiable* offenses by burning on the hand (see BENEFIT OF CLERGY); and with a view still further to repress theft and petty larceny, the 10 and 11 Will. III. c. 23, s. 6, provided that such offenders as had the benefit of clergy allowed them should be "*burnt in the most visible part of the left cheek, nearest the nose.*" This additional severity, however, not having the desired deterrent effect, but the reverse, was repealed by the 5 Anne c. 6, which nevertheless provided for offenders being burnt on the hand as formerly. The latter punishment, however, was entirely abolished by an act passed in 1822, the 3 Geo. IV. c. 38. Brawling in church (q.v.) was, by the 5 and 6 Edw. IV. c. 4, made an offense punishable by having one of the ears cut off, or, the offender having no ears, by B. with the letter F on the cheek. This punishment was repealed by the 9 Geo. IV. c. 31. B., therefore, in the case of felonies, has been entirely abolished.

BRANDIS, CHRISTIAN AUG., professor of philosophy in Bonn, was b. at Hildesheim, 13th Feb., 1790, his father being J. D. Brandis, one of the most distinguished physicians of his time. Having studied philology and philosophy at Kiel and Göttingen, he began lecturing in the university of Copenhagen, from which he removed to Berlin (1816). Here he was soon called upon to take part in the preparations for the great critical edition of the works of Aristotle, contemplated by the Berlin academy of science, 4 vols. (Berlin, 1831–36); and with this object, spent several years, along with Immanuel Bekker (q.v.), in exploring the chief libraries of Europe. In 1821, he resumed his academic career in the university of Bonn, where he edited Aristotle's *Metaphysics* (vol. i., Berl. 1823), *Scholia in Aristotelem* (Berl. 1836), and *Scholia Græca in A. Metaphysicam* (Berl. 1837). He accepted, in 1837, a call from the young king of Greece, and spent several years in that country as cabinet counselor. As a result, we have his *Mittheilungen über Griechenland*, Communications on Greece (3 vols., Leip. 1842). Other works of his are *Handbuch der Geschichte der Griech.-Röm. Philosophie* (3 vols., Berlin, 1835–66) and *Geschichte der Entwickelungen der Griech. Philosophie und ihre Nachwirkungen im röm. Reiche* (Berlin, 1862–64). He died July 24, 1867.

BRANDLING. See PAR and SALMON.

BRANDON, a village in Rutland co., Vt., on the Rutland division of the Central Vermont railroad, 16 m. n. of Rutland; pop. of township, '80, 3280. The place is noted for marble quarries. There are many manufactories; scales, iron castings, marble works, and mineral paints being among the most important. Near by are mines of iron, kaolin, and lignite.

BRANDON, a t. on both sides of the Little Ouse or Brandon river, where it separates Norfolk from Suffolk, 78 m. n.n.e. from London by road. Pop. '71, 2116. It has a considerable corn trade. Great rabbit-warrens occur near Brandon. There was formerly an extensive manufactory of gun-flints here, the army being exclusively supplied with these articles from B. before the introduction of percussion-caps.

BRANDT, SEBASTIAN, the author of a very popular German book, the *Narrenschiff*, or Ship of Fools, was b. at Strasburg, 1458; studied law and the classics with zeal at Basel, where he received permission to teach; and soon became one of the most influential lecturers in that city. The emperor Maximilian showed his regard for B. by appointing him an imperial councilor. He died at Strasburg in 1521. His Ship of Fools, a satire on the follies and vices of his times, which was published at Basel, 1494, is not very poetical, but is full of sound sense and good moral teaching, and was so much esteemed that the German popular preacher Geiler occasionally took his texts from it. It was translated into Latin by Locher (1497); and into English by Henry Watson, *The Grete Shyppe of Fooles of the Worlde* (1517); partly translated and partly imitated by Alexander Barclay, *The Shyp of Folys of the Worlde* (1508); and imitated by W. H. Ireland in the *Modern Ship of Fools* (1807). It has also appeared in French, and indeed in almost all European languages.

BRANDY (Ger. *branntwein*, Fr. *eau de vie*) is a term sometimes applied generically to all kinds of ardent spirits, but usually restricted to the liquid obtained by distilling the fermented juice of the grape. See DISTILLATION. The fermented liquors or wines which are employed for that purpose are various, and contain a proportion of alcohol (q.v.), which runs from 10 to 25 per cent of their weight. The red wines generally are pre-

ferred, as containing most alcohol; but though they yield a larger amount of B. than the white wines, yet the latter afford a spirit which possesses a finer flavor and more agreeable taste. 1000 gallons of wine give by distillation from 100 to 150 gallons of B., which varies in strength, but is commercially judged of according to the quantity of *eau de vie* or B. *à preuve de Holland* which it contains, and is generally diluted with water until it contains from 50 to 54 per cent by weight of absolute alcohol. When originally distilled, B. is clear and colorless, and if wished to remain so, is received and kept in glass vessels; but when placed in wooden casks, the spirit dissolves out the coloring matter of the wood, and acquires a light sherry tint, which is deepened by burnt sugar and other coloring matter, intentionally added by the dealers. The pleasant aroma of B. is due to the presence of more or less of fusel oil (q.v.) accompanied by œnanthic ether (q.v.). The most famous B. is that distilled in Cognac, a district in the w. of France, from the choicest wines, but comparatively little of that sold under the name of *Cognac* comes from this district. A second-class B. is obtained from the red wines of Portugal, Spain, etc., as also from the refuse (*marc*) of the grapes left in the wine-press, the scrapings of wine-casks and vats, the deposits in wine-bottles, etc.; and very much of the B. sold in Great Britain and Ireland is prepared at home from ordinary grain alcohol, by adding thereto argol (q.v.), bruised French plums, some French wine-vinegar, a little good Cognac, and re-distilling, when the spirit which passes over may be colored with burnt sugar, or by being kept in an empty sherry cask. Occasionally, grains of Paradise and other acrid matters are added, to give the B. a fictitious strength; and catechu or oak bark, to give it an astringent taste. B. is the form in which alcohol is administered medicinally either internally or externally. It is distinguished from other ardent spirits by its light, cordial, and stomachic properties, and especially when set fire to for a minute or two, forming what is known as *burnt B.*, it is valuable as a household remedy for diarrhœa. B. is administered internally (1), in *mild cases of diarrhœa*, unaccompanied by inflammation, but attended with griping pain, and the addition of nutmeg is productive of good; (2), as a *powerful excitant* for restoring patients who are suffering from suspended animation, and to relieve those who are laboring under fainting symptoms during an operation in surgery; (3), as a *stimulant and restorative*, where patients are much depressed in the ultimate stages of fever; and (4), as a *general stomachic stimulant* in indigestion after taking food, in the relief of flatulency and spasms in the stomach, and to check vomiting, especially in sea-sickness. Externally, B. is employed (1), in healing sores, and in stopping hemorrhage or the oozings of blood from bruised or injured parts, and is generally applied by soaking linen or cotton with it, and laying the cloth on the part; and (2), in hardening the skin or cuticle over tender parts, the soles of feet which have been blistered, and the nipples of females for several days before delivery. The action of B. externally appears to be strictly chemical, as it coagulates the albumen of blood, and otherwise tends to render more solid all flesh tissue.

The duty on B. imported into Great Britain, which from 1814 had been as high as 22*s.* 10*d.* a gallon, was reduced in 1846 to 15*s.*, and in 1860 to 8*s.* 2*d.*, but was soon afterwards raised to 10*s.* 5*d.* The consumption in the United Kingdom from 1822 to 1862, averaged about 1,400,000 gallons. From 1862 to 1872, it averaged 4,600,000 gallons. The import in 1875 was 4,087,441 gallons.

BRANDYWINE CREEK, a stream 36 m. in length, rising in Pennsylvania, and flowing through Delaware. In the latter state, it enters Christiana creek, about 2 m. above its confluence with the Delaware river, and immediately below Wilmington, a port of entry. It possesses a historical interest in connection with the war of independence—a battle, in which the British had the advantage, having been fought on its banks in Sept., 1777.

BRANEC'KI, or BRANICKI, FRANCISZEK XAWERY, d. 1819; a Polish statesman, who attended Poniatowski at St. Petersburg, and was privy to his amours with Catherine II. When Poniatowski came to the throne he rewarded B. with many honors, and he rose to be grand constable. B. was among the earliest to favor the partition of Poland, and was also active in the second dismemberment, for which, in 1794, he was declared to be a traitor. After the final partition he retired from public life and spent his days on the estates given to him by Catherine. In 1840, his descendants were made counts.

BRANFORD, a t. in New Haven co., Conn., on Long Island sound, and the New York and New London railroad, 8 m. e.s.e. of New Haven; pop. '80, 3,047. It is a place of summer resort, and has a good harbor for small craft.

BRANK, or BRANKS, an instrument formerly used for the punishment of scolds in England and Scotland, and often in the former country called "the scold's bridle." It seems to have come in place of the ducking-stool or cucking-stool (q.v.). "I look upon it," says Dr. Plot, in his *Natural History of Staffordshire*, published in 1686, "as much to be preferred to the cucking-stool, which not only endangers the health of the party, but also gives the tongue liberty betwixt every dip: to neither of which is this at all liable; it being such a bridle for the tongue as not only quite deprives them of speech, but brings shame to the transgression, and humility thereupon, before it is taken off." The B., in its simplest form, is a hoop of iron, opening by hinges at the sides, so as to inclose the head, and fastened by a staple with a padlock at the back; a plate within the front of the hoop projecting inwards, so as to fit into the mouth of the culprit, and by pressing upon the tongue, be an effectual gag. There must have been difficulty in keeping such

a hoop in its place; and so it received the addition of a curved band of iron, having a triangular opening for the nose, passing over the forehead, and so clasping the crown of the head that escape from it was scarcely possible. This may be regarded as the second form of the brank. In the third form, the curved band was hinged in the middle, and, passing over the whole head, was locked into the staple at the back of the hoop. The next addition seems to have been a second band crossing the first at right angles, so as to clasp the sides of the head, and keep the B. still more firmly in its place. In its last most complicated shape, the B., by the multiplication of its hoops and bands, took the form of a conical cage or lantern, with a door behind opening by a hinge and fastened by a staple, the front being fashioned into a rude mask, with holes for mouth, nose, and eyes. In one instance, the mask quite covers the face, the iron plate being hammered out to fit the nose, with apertures for the nostrils and the eyes, a long hollow conical peak, perforated with holes, being affixed before the mouth. The way in which the punishment of the B. was inflicted, may be described in the words of an eye-witness, reported by a country gentleman of Northumberland, Ralph Gardiner of Chriton, in a work, called *England's Grievance Discovered in Relation to the Coal Trade*, published in 1655, and dedicated to Cromwell: "John Willis of Ipswich, upon his oath, said that he was in Newcastle six months ago, and there he saw one Anne Bidlestone drove through the streets by an officer of the same corporation holding a rope in his hand, the other end fastened to an engine called the branks, which is like a crown, it being of iron, which was muzzled over the head and face, with a great gap or tongue of iron forced into her mouth, which forced the blood out; and that is the punishment which the magistrates do inflict upon chiding and scolding women, and that he hath often seen the like done to others." When the B. first came into use is unknown. It is found at Edinburgh in 1567, at Glasgow in 1574, at Stirling in 1600, and at Macclesfield, in Cheshire, in 1623. One B. in the church of Walton-on-Thames, in Surrey, has the date of 1633. In another, called "the witches' bridle of Forfar," dated in 1661, the gag for the mouth is not a flat plate, but a long piece of iron with three sharp spikes. Of two examples in private custody in England, one has the date of 1688, the other the crowned cipher of king William III. The B. was used at Langholm, in Dumfriesshire, in 1772; it was used still more recently at Manchester and at Macclesfield; and in the *Archæological Journal* for 1856, it is stated that "at Bolton-le-Moors, in Lancashire, the iron bridle was still in use, not many years since, for the correction of immorality: it was fixed in the female's mouth, and tied at the back of the head with ribands, and thus attired, the offender was paraded from the cross to the church steps, and back again." Examples of the B. may be seen in the Ashmolean museum at Oxford, in the National museum of the antiquaries of Scotland at Edinburgh, in the county hall at Forfar, in the Guildhall at Litchfield, in the town hall at Macclesfield, in the parish church of Walton in Surrey, and in St. Mary's church at St. Andrews in Fife.—Brank was at one time a common name in Scotland for any sort of bridle. The word is supposed to be derived from the Teutonic *pranghe*, a bridle. In the Dutch Netherlands, the pillory was called *pranghe*, from the yoke or collar in which the neck of the culprit is held. An instrument resembling the B. in its simplest form is said to have been in use among the Spaniards in the West Indies for the punishment of refractory slaves. See JOUGS.

BRANNAN, JOHN MILTON, b. 1819; a graduate of West Point; served in the Florida, Mexican, and the civil war; was made brevet maj.gen. in 1865.

BRANT, a co. in the province of Ontario, Canada, drained by Grand river and traversed by the Grand Trunk, Great Western, and Canada Southern railways; 420 sq. m.; pop. '71, 32,259. The principal productions are lumber, wool, hops, grain, butter, cheese, etc. Chief town, Brantford.

BRANT, JOSEPH (THAYENDANEGA), 1742–1807; a noted Indian chief of the Mohawks. He was a friend and secretary of gen. William Johnson in the Indian wars of 1755 and later, and took the English side in the revolution, having part in the massacre of Cherry valley and other bloody transactions. After the war he used his great influence to preserve peace. B. was strongly opposed to the sale of liquor to his red brethren. He had a tolerable education, and assisted in publishing a prayer-book and St. Mark's gospel in the Mohawk tongue. Col. Stone of New York wrote *The Life of Joseph Brant*, which was a popular book for half a century.

BRANTFORD, a t. in Ontario, Can., in Brant co., 75 m. n.w. of Buffalo, on the banks of Grand river, on the Goderich and Buffalo railroad; pop. '71, 8107. Manufacturing is the chief business.

BRÂNTOME, PIERRE DE BOURDEILLES, Seigneur de, was b. at Perigord, in Gascony, about 1527. He traveled in several countries in the capacity of chamberlain to Charles IX. and Henry III.; fought against the Huguenots (1562), in Barbary (1564), and went in 1566 to Malta, to fight against the Turks. After his return to the court of France he retired into private life, and wrote his *Mémoires*, full of self-praise but very interesting, as they afford a lively portraiture of the manners and morality of his times, the women, in particular, being very severely handled. The style is charmingly piquant, full of ingenious turns of expression, sudden sallies of wit, occasional flashes of eloquence, and withal so naïvely simple, that if the author cannot on account of the abundance of his gossip be reckoned a grave historian, he must needs be considered a most fascinating

chronicler. B. died July 15, 1614. His complete works were published at the Hague (10 vols., 1740), and were republished by Buchon in the *Panthéon Littéraire* (2 vols., Paris, 1837).

BRASDOR'S OPERATION. It is stated in the article ANEURISM, that a cure is effected in that disease by successive layers of the fibrine of the blood being deposited in the aneurismal sac, and that surgeons bring about this desired end by tying the artery at some point between the heart and the aneurism. In some situations it is impossible to do this, and therefore it was suggested by Brasdor that the course of the blood should be impeded *beyond* the aneurismal sac. This has not been tested to any great extent, but most surgeons think favorably of it; and the same principle can be carried out by pressure, without any cutting operation, as was shown by Mr. Edwards of Edinburgh, who succeeded in obliterating aneurisms at the root of the neck by pressure applied to the arteries beyond the tumor.

BRASENOSE, one of the colleges of Oxford university, sometimes called King's hall and college of B., was founded in the year 1509, by the joint benefaction of William Smith, bishop of Lincoln, at one time chancellor of the university, and sir Richard Sutton, knight of Prestbury, in Cheshire. The original foundation was for a principal and twelve fellows. Eight fellowships were afterwards added by various benefactors, from 1522 to 1586. This college is also very rich in scholarships and exhibitions; more particularly the Hulme exhibitions, 15 in number, of value £135 per annum each, besides £20 to be spent in books, to be approved of by the principal. The statutes of this college, which were issued in 1520, three years after the publication of Luther's theses, seem to have been framed by a person warmly attached to the Roman Catholic faith. They enjoin devotional exercises of a peculiarly popish character, such as repeating five times each day the Lord's prayer in honor of the five wounds of the crucifixion, of the angelic salutation in honor of the five joys of the blessed virgin, etc. These devotions were in some cases enforced by fines and whipping. The origin of the name of the college is obscure. Legends say that it was originally "brewing-house," which became corrupted into the present appellation; but Anthony Wood tells us that the college was "near finished out of the ruins of several hostels, the chief of which was Brasenose hall, so called, without doubt, from such a sign, which was in ancient time over its door, as other halls also had, viz., Hawk or Hieron hall, Elephant, Swan, or Bull hall." The former theory is supported by the fact, that B. has always been celebrated for the excellence of its beer; the latter is borne witness to by a nose in brass, curiously fashioned, which is now conspicuous over the great gateway. Till lately, all the fellowships were confined to natives of certain counties. The senior fellowships, owing to the appropriations of fines to the seniors, were very valuable, about £500 per annum; while the junior fellowships were about £80. By the commissioners appointed under 17 and 18 Vict. c. 81, many important alterations have been introduced. Five out of the twenty fellowships have been suppressed, one being elevated to the endowment of a professorship, the remaining four to the establishment of additional scholarships. All the remaining fellowships have been thrown open. The senior fellowships have been limited to £300 per annum; the junior raised to £150. Various oaths, previously taken by the fellows, committing them to statements which were untrue, and binding them to duties impossible to be performed, have been by the same authority abolished. B. presents to 24 benefices, besides 29 pieces of preferment vested in the trustees of the Hulme exhibitions, for behoof of the exhibitioners. Though considered what is commonly called a "good college," B. has never attained much distinction in the "schools." In all probability this has been owing to the restrictions subject to which its endowments were so long administered. The number of names on the books is about 500; the number of resident undergraduates is considerably over 100.

BRASH. See PYROSIS.

BRASH, SHIVERS, BLAZE, and RUBBLE, are names given in different districts to layers of broken and angular fragments of rock. They occasionally form the basement bed of alluvial deposits. At Canonmills, and other places near Edinburgh, the bowider-clay rests on a bed of shivers composed of fragments of the subjacent bituminous shale.

BRASHEAR CITY, a port of entry in Louisiana, on the Atchalafaya river, 80 m. from New Orleans, on the Morgan, Louisiana and Texas railroad. It has a good harbor, and a custom-house. The name has recently been changed to MORGAN CITY.

BRASIDAS, the bravest and most energetic Spartan general in the earlier years of the Peloponnesian war. Having distinguished himself (B.C. 431) by the courage with which he relieved the town of Methone from a hostile attack, he was made one of the chief-magistrates of Sparta. In 424, he relieved Megara; and in his expedition to Macedonia, in the same year, to aid the states which had thrown off their allegiance to Athens, he was completely successful. In 422, B., who could obtain no reinforcements from Sparta, had to encounter with his helots and mercenaries the flower of the Athenian army under Cleon. A battle took place at Amphipolis, in which both Cleon and B. were killed, but the army of the former was completely beaten. He was buried at Amphipolis, within the walls, and for long after his death his memory was honored as that of a hero, by the celebration of yearly sacrifices and games. The Greek writers speak highly of Brasidas.

Thucydides notices his eloquence, unusual in a Spartan, his justice, liberality, and wisdom, while Plato compares him to Achilles; but circumstances are not wanting to show that he was as much endowed with Spartan duplicity as with Spartan courage.

BRASS is an alloy of copper and zinc, largely used for household furnishings, certain parts of machinery, and other ornamental and useful articles. Technically, the term B. is extended so as to include compounds of copper and tin, as in *brass-ordnance*, the *brasses* or bearings of machinery, etc.; but such alloys of copper and tin, though styled *hard* B., are more strictly varieties of bronze (q.v.), and the present notice will be confined to the alloys of copper and zinc, or *yellow* brass. In ancient history, biblical and profane, frequent allusions are made to the employment of B. in the construction of musical instruments, vessels, implements, ornaments, and even gates; but as no mention is made of its mode of manufacture, or even of its composition, it is doubtful if the B. of the ancients was composed of copper and zinc. In the manufacture of B. on the large scale, two parts by weight of copper to one part of zinc are used, the zinc being one half the weight of the copper; but alloys are made for particular purposes with less or greater proportions of zinc. Thus, where a material of more than ordinary tenacity is required, the zinc is reduced to one fourth the weight of the copper; and where an alloy of a hard and brittle nature, possessing little resisting power, is wished for, the zinc is increased to an amount equal with the copper, or greater. In the manufacture of B., either of two processes may be followed. The direct method is to fuse the zinc in a crucible, and gradually add the copper in pieces. But this process is attended with disadvantage, owing to the volatile and oxidizable nature of zinc. The indirect method of forming B. is that which is generally followed in England and elsewhere, and consists in heating in crucibles or pots a mixture of calamine (carbonate of zinc, $ZnOCO_2$), charcoal, and thin pieces of scrap or grain copper. The calamine (q.v.) is generally first calcined or roasted, so as to expel any traces of sulphur, then mixed with one fourth of its weight of charcoal, and this mixture introduced into the crucible, after which the metallic copper is diffused through the mixture by being beaten in with hammers or mallets. The proportions employed are 3 parts of the mixture of calamine and charcoal to 2 parts of copper; and when introduced into a furnace, and subjected for 5 to 24 hours to the action of a white heat, the charcoal reduces the calamine and separates the zinc, which, combining with the copper, forms 3 parts of B., containing about 2 of copper to 1 of zinc.

For ordinary purposes, B. is first cast into plates of about 100 lbs. weight, and $\frac{1}{4}$ to $\frac{1}{2}$ in. thick, which can be readily broken up, remelted, and cast in a mold of any desirable shape or size. The crude casting so obtained is generally screwed to a turning-lathe, and turned and bored into the required form with iron tools. B. is very largely employed in the construction of door-handles, window-shutter knobs, etc.; and since the introduction of gas, though the brazen candlesticks have almost ceased to exist in towns, yet the immense number of stop-cocks and brass pendants and brackets required, has given a considerable impetus to the brass manufacture. The proportion of copper and zinc in the alloys resembling B., and which are known as *gilding metal*, *Mannheim gold*, *pinchbeck*, *bath metal*, *Bristol brass*, *Muntz sheathing metal*, *spelter*, *solder*, and *Mosaic gold*, have already been noticed under Alloy (q.v.).

BRASSARTS, the name of the pieces which, in plate-armor, protected the upper part of the arms, and united the shoulder and elbow pieces. Brachiale was the ancient name for brassarts. When the front of the arm only was shielded, the pieces were called demi-brassarts.

BRASSES (*sepulchral*), large plates of brass, or of the mixed metal called *latten* or *laton*, inlaid on slabs of stone, and usually forming part of the pavement of a church. The figure of the person intended to be commemorated was generally represented either by the form of the brass itself, or by lines engraven on it. Such, however, was not always the case, an ornamented or foliated cross, with other sacred emblems, being frequently substituted for the figure. Nor was the practice of imbedding them in the pavement uniform, as we sometimes find them elevated on what were called altar-tombs. It has been ascertained that the incised lines on these B. were originally filled up with some black resinous substance, and that in the case of armorial decorations, and the like, the field or background was often cut out by the chisel, and filled up with some species of coarse enamel, by which means the appropriate tinctures were produced. In England, the brass was usually of the form of the figure, the polished slab forming the ground, and the ornaments, arms, inscription, etc., were also inserted each as a separate piece. On the continent, where the metal was more abundant, the B. were one long unbroken surface, formed of plates soldered together, on which were engraved all the objects represented, the portions of the plate not so occupied being ornamented by elaborate flower-work. B. are known to have been used for monumental purposes from a very early period, though there are no existing traces of them in England previous to the middle of the 13th century. There is reason to think, that if not imported from France, they were at first executed by French artists. Latterly, the art took root in England, and English B., like English architecture, acquired a distinctive national character. The oldest complete specimen in England is that on the monument of sir John d'Aubernoun, at Stoke Dabernon. The knight died in 1277, and it is probable that the

brass was executed shortly after that date. Next in antiquity are those of sir Roger de Trumpington, who died in 1289, and sir Richard de Buslingthorpe, 1290; the former at Trumpington in Cambridgeshire, the latter at Buslingthorpe in Lincolnshire. In addition to the interest which they possess from their age, these B. are remarkable as being still unsurpassed in the beauty of the workmanship and the spirit of the design. As regards the earliest English B., it is further worthy of note that they are so similar, both in design and execution, as to lead to the conjecture that they are the work of one artist; whilst from their differing in many respects from the B. which were executed on the continent at the same period, it would seem that this artist, if not an Englishman, at all events worked exclusively in this country. In the following century (1325), on the brass of sir John de Creke, at Westley Waterless, in Cambridgeshire, the artist's mark is affixed by a stamp—a fact which has been regarded as a proof that his craft had attained to some importance, and that his services were pretty frequently called into requisition. But in this case, as in every other, with one exception, the name of the artist has perished. The exceptional case is that of the brass which once covered the tomb of bishop Philip, in the church of the Jacobins at Evreaux, in Normandy, where the inscription ended with the words, "Guillaume de Plalli me fecit." Many of the B. executed in England in the 14th c. are probably Flemish; and in the churches at Bruges some exist which appear to be by the same hand with others which are found in England. There can be little question, indeed, that for this, as for most of the other departments of the arts, which were afterwards successfully cultivated in England, we were indebted to continental artists. Nor will it surprise those who know the results of recent archæological investigations in similar subjects, to learn that the artists of France and Flanders in their turn were debtors to those of the worn-out empire of the east. As in painting, sculpture, and architecture itself, so in the art of working in brass, the sparks of antique genius which smoldered in Bysantium were the means of kindling those which afterwards burned so brightly in modern Europe. The taste for lingering

> Among the knightly brasses of the graves,
> And by the cold *hic jacets* of the dead,

has grown to something like a passion of late, and there are few subjects which have been more carefully illustrated than that of sepulchral brasses. References to most of the leading works, too numerous to be mentioned here, will be found in Parker's *Glossary of Architecture*, in an article in which their results have been carefully condensed. Of modern B., the most remarkable is that in the cathedral at Cologne, engraved in 1837, as a monument to the late archbishop.

BRASSEUR DE BOURBOURG, Charles Étienne, Abbé, b. Sept. 8, 1814; a French archæologist who studied theology at Ghent and was ordained at Rome in 1845. He was appointed vicar-general at Boston, Mass., in 1846. From 1848 to 1863, he spent nearly all his time in explorations in the s.w. United States, Mexico, and Central America, and in 1864 he was archæologist to the French expedition to Mexico. He is known for careful and philosophical study of indigenous American languages. In 1864, he announced that he had discovered in old archives at Madrid a key to inscriptions on the Central American monuments, and subsequently published a grammar and vocabulary of the Aztec tongue. One of his more important works is a *History of the Civilized Nations of Mexico and Central America during the ages prior to Christopher Columbus;* written from original documents entirely unedited, taken from the ancient archives of the aborigines, containing words of the heroic period in history of the Toltec empire." A bibliophilist of the day says of Brasseur de Bourbourg: "It is very difficult to assign the place which this extraordinary man will occupy in the annals of science, for his works are to-day nearly as great mysteries as the hieroglyphs his labors have illustrated. His industry in his researches into the history of the Aztec races is something not less than marvelous. When he had, with heroic sacrifice of all personal ease, accepted the life of self-immolation of a missionary to the Indians of Mexico; had studied for years the relics of Aztec picture-writing; had learned and systematized in great treatises their modern dialects; the immense works which he then printed upon the history of the pre-Cortesian races, made scarcely a ripple on the quiet of the scientific world. He stands alone in the vast temple of learning which he has restored, if he did not erect. No human being can contest his solution of Aztec pictographs, nor does there exist one who can prove it to be true. His numerous volumes have at least this merit—they have done much to perpetuate the memory of a wonderful race."

BRASSEY, Thomas, 1805–70; an English surveyor, widely known as a railway contractor of great capacity and enterprise. He was of an ancient family; received an ordinary education, and at the age of 16 became apprentice to a surveyor, to whose business he succeeded. His first railway contract was for a portion of the Grand Junction; then he completed the London and Southampton, with contracts involving $20,000,000, and 3000 workmen. In 1840, with a partner, he built the railway from Paris to Rouen, and a few years later was concerned in five other French lines, and as many in England, employing 75,000 men, and paying for labor alone from $75,000 to $100,000 every week. The capital involved in his contracts at this period was equal to $180,000,000. Having built railways in the countries named, and in Holland, Prussia, Spain, and Italy, he undertook the Grand Trunk of Canada, 1100 m. in length, with the great

bridge over the St. Lawrence at Montreal; and in subsequent years divisions of his army of laborers were found in almost every country in Europe, India, Australia, and South America. He was generous, modest, and simple in his tastes and manners. Though undecorated at nome, he received the cross of the legion of honor from France, the order of St. Maurice and St. Lazarus from Victor Emmanuel, and the iron cross (the first time it was given to a foreigner) from Austria.

BRASSICA, a genus of plants of the natural order *cruciferæ* (q.v.), distinguished by a round and tapering 2-valved pod (*silique*), of which the valves have each only one straight dorsal rib and no lateral veins, the seeds globose, in one row in each valve, and the cotyledons (q.v.) conduplicate (folded laterally). The species are chiefly natives of the temperate and colder regions of the old world; several are British plants. A number of species are very extensively cultivated, both in fields and gardens, and are of great importance in an economical point of view, particularly the cabbage (q.v.), of which kale, borecole, colewort, and different kinds of greens, Savoy, cauliflower, broccoli, Brussels sprouts, and kohl rabi are varieties; turnip (q.v.); rape (q.v.) (colza, cole-seed) and navew (q.v.). Among the British species is one, called Isle of Man cabbage, or wallflower cabbage (*B. monensis*), which differs from all these, and in some measure departs from the strict generic character, in having the valves of the pod 3-nerved, and one or two seeds in its beak. It has deeply pinnatifid leaves. It is found on the sandy shores of the w. of Scotland, the Isle of Man, the n. of Ireland, etc. Sheep and oxen are very fond of it, and it has been suggested that it might be profitably cultivated for feeding cattle. Its peculiar adaptation to sandy soils ought to recommend it to attention.

BRATTICE, the term applied to a partition of plate-iron or other suitable material which divides the main shaft of a mine lengthwise into two or more parts or gangways, to secure upward and downward ventilation.

BRATTLE, THOMAS, 1657–1713; b. Boston; a graduate of Harvard, who became one of the leading merchants of the eastern states. He published many papers on astronomical subjects, and in a private letter gave a good account of the witchcraft delusion.

BRATTLEBORO, a t. in Windham co., Vt., on the Connecticut river, and the Central Vermont railroad; 96 m. w. of Boston; pop. '70, 4933; in '80, 5882. It is connected with Hindsdale, N. H., by a bridge. It has an asylum for the insane, endowed with $10,000 by Mrs. Anna Marsh, a seminary for young ladies, and several large factories.

BRAUN, AUG. EMIL, an eminent archæologist, was b. 19th of April, 1809, at Gotha, in Germany. He studied at Göttingen and Munich, where he made the friendship of his teachers, Schelling and Gerhard; with the latter of these he went to Rome in 1833, and in a short time was made librarian, and subsequently secretary, to the archæological institute. He died at Rome, on the 12th Sept., 1856. B. wrote many valuable works on art in German, Italian, and even English. Among these may be mentioned *Il Giudizio di Paride* (Paris, 1838); *Kunstvorstellungen des geflügelten Dionysus* (Munich, 1839); *Griechische Mythologie* (Hamburg and Gotha, 1850); *Griechische Götterlehre* (Gotha, 1851–55); *Vorschule der Kunstmythologie* (Gotha, 1854, with 100 copper-plate engravings), translated into English by Mr. Grant; and an admirable guide-book, *Die Ruinen und Museen Roms* (Brunswick, 1854), translated into English, 1855. B. also executed numerous electrotype copies of ancient works of art.

BRAUNSBERG, a walled t. of e. Prussia, in the government of Königsberg, about 35 m. s.w. of the city of that name. It is situated on the Passarge; contains a Catholic seminary and gymnasium; and has manufactories of woolen and linen, and a considerable trade in yarn, grain, ship-timber, etc. Pop. '76, 10,796.

BRAUWER, or BROUWER, ADRIAN, a painter of the Flemish school, was b. at Oudenarde (or as others say, at Haarlem) in 1608. He was apprenticed to the well-known artist Franz Hals, who made profitable use of his pupil's great talents; keeping him in a garret like a prisoner, and making him work almost night and day, in painting small pictures, which Hals sold at very good prices. By the advice of a fellow-pupil, Adrian Van Ostade, young B. ran away from his hard taskmaster, and going to Amsterdam, found, to his own astonishment, himself famous as a painter. He now worked for himself, and might soon have made a fortune; but his intemperance was so extreme, that, it is said, he would never apply himself to painting while he could have credit or be supplied with liquor at a tavern. During the war in the Netherlands he went to Antwerp, where he was seized as a spy, and taken to the citadel. Here, to prove himself a painter, he executed a sketch of the guards who had him in their custody. This picture was shown to Rubens, who immediately exclaimed: "That is the work of Brauwer! No other artist could treat the subject in that style." B. was liberated through the interposition of Rubens, who gave him a lodging, supplied him with clothing and food, and in every way acted as a generous friend. But the sole return for all this kindness was, that B. secretly fled from the house of his patron, in order to renew his career of low dissipation. After visiting Paris, and failing to find work, he returned to Antwerp, where he died in the hospital (1640), and was interred, at the cost of Rubens, in the Carmelites' church. All B.'s paintings are marked by power and harmony of

coloring, and clearness of chiar-oscuro. They are pervaded by a jovial humor, and betray the favorite haunts and associations of the painter.

BRA'VI were those individuals in Italy, but especially in Venice, who undertook to perform any dangerous deeds for money. It is now employed chiefly to designate hired assassins. The Italians also gave the name of B. to those fanatics in the Turkish army, who, after maddening themselves by opium, rushed upon the ranks of the enemy, and so met death.

BRA'VO, "excellent!" "well done!" an Italian exclamation of praise, the superlative form of which is *bravissimo!* It is commonly used in England without distinction of number or gender; but the Italians say *bravo!* to a male singer or actor, *brava!* to a lady, and *bravi!* to a company of actors or singers.

BRAVO, NICOLAS, 1790–1854; a Mexican statesman and soldier who took part in the revolution of 1810 and others that followed. He was a firm supporter of Iturbide, the last emperor, and was a member of the regency of 1822; then deserted the emperor and was a member of the provisional government. In 1827, he led a revolt against Bustamente. In 1842, he held the chief executive power in the absence of Santa Anna, and was again president in 1846 until forcibly deposed. He fought for Mexico in the war with the United States in 1846, and after 1853 retired from public life.

BRA'VO DEL NOR'TE, or RI'O GRAN'DÉ, the largest river in the gulf of Mexico next to the Mississippi. It is politically important, as being throughout its whole course the boundary between Texas and Mexico; while physically its mouth may perhaps be regarded as that point on the coast where Central America, in its geographical aspect, begins to taper itself off towards the south. It rises in the Rocky mountains, near lat. 38° n., and long. 106° 30′ w.; and after a course of 1800 m. in a generally s.e. direction, it enters the sea near lat. 25° n., and long. 97° west. The commercial value of the river is not great, for, besides being for the most part very shallow, it is here and there beset by rapids and sand-bars. Smalls teamers, however, have got up as far as Kingsbury's rapids, about one fourth of the entire length of the stream.

BRAVO-MURILLO, JUAN, b. 1803; a Spanish statesman; at first a theological student; then a lawyer; the editor of the first law journal in Spain, also editor of two other journals. In 1837, he was a leading member of the Cortes, but was proscribed after the revolution of 1841, and took refuge in France. He was in the ministry in 1847, and on the resignation of Narvaez became prime minister. The revolution of 1854 caused him to fly again, but after 1856 he was recalled and given eminent positions.

BRAVU'RA, an Italian word, in music applied to a composition as well as style of performance. As a composition, the B. is an air or song, with many difficult passages and divisions of notes, requiring great spirit and volubility of execution. The intention of merely astonishing by execution has brought this species of composition into undeserved discredit. The B. style first came from the Neapolitan school. Rossini, Bellini, etc., united the B. with the cantabile style; and instead of leaving the embellishments to the taste of the singer, wrote the whole of the notes in the music. The compositions of Mozart, Beethoven, etc., give abundant proofs of how they united true artistic merit with the B. style

BRAWLING IN CHURCHES, in the law of England, is an offense against the public peace. This offense may generally be described as quarreling or creating a disturbance in a church; therefore, mere quarrelsome words, which are neither an affray nor an offense in any other place, are penal here. It was enacted by 5 and 6 Edw. VI. c. 4, s. 3, that if any person shall, by words only, quarrel, chide, or brawl in a church or churchyard, he might be prohibited from entering the church; and persons assaulting others there might be excommunicated, or have an ear cut off and be branded in the cheek. But that statute was repealed in 1860 as regards laymen, and justices of the peace, under the statute 23 and 24 Vict. c. 32, now deal with riotous, violent, and indecent behavior in churchyards or in churches and dissenting chapels, by fining the offender £5, or committing him to prison for two months. This enactment protects all kinds of religious services, though the jurisdiction of the ecclesiastical courts continues for some purposes. Constables and church-wardens may immediately apprehend and remove the offender. Other regulations respecting the disturbance of a congregation, or molestation of a clergyman during divine service, will be found in the 1 Mary, c. 3 (1553), which, although of Roman Catholic origin and application, is still held to be the law for the protection of the Protestant established church. It enacts (section 2) that if any person or persons shall willingly and of purpose, by overt word or deed, molest or disquiet any preacher . . . . in any sermon, preaching, or collation, that he shall make in any church, chapel, *churchyard*, or in *any other* place or places, used or appointed to be preached in; or (section 3) if any person or persons shall molest a priest preparing or celebrating mass, "or *other such* divine service, sacraments, or sacramentals as was most commonly frequented and used in the last year of the reign of the late sovereign lord, king Henry VIII., or that *at any time hereafter* shall be allowed, set forth, or authorized by the queen's majesty;" or shall abuse the blessed sacrament—such person or persons shall be liable to be committed to gaol, there to remain without bail or mainprize for the space of three months then next ensuing; and further, to the next quarter-sessions,

at which the persons so offending shall only be delivered and discharged out of prison upon sufficient sureties for their good behavior during one whole year. The act contains other regulations for the protection of the ministrations of the church, and it saves the jurisdiction of the ecclesiastical law.

By another act, 1 Will. and Mary, c. 18, s. 18, passed in 1688, it is provided that if any person or persons shall disquiet or disturb any cathedral or parish church, chapel, or other congregation, or misuse any preacher or teacher, such person or persons may be committed to prison, and, on her conviction, be fined £20.

It remains to be added, that reviling church ordinances subjects to fine and imprisonment—and profaning the Christian religion, and depraving the Book of Common Prayer, are also subjects of penal legislation. See on this subject 1 Eliz. c. 2, and the 14 Chas. II. c. 4. See also BLASPHEMY and RELIGION, OFFENSES AGAINST, in which latter the Scotch law on the subject of this article will be found stated.

BRAWN, a preparation of meat made from the head and belly-piece of a young pig, with the addition of ox-feet, to render it gelatinous. The whole is rolled up tight in sheet-tin, and boiled for four or five hours. The moisture is then well pressed out of it, and having been allowed to stand for some ten or twelve hours, the meat is put into cold salt and water, and is then fit for use. B. seems to have been a well-known dish as early at least as the latter part of the 15th c., for in Tyndale's version of the Book of Common Prayer, revised by Cranmer, and still in use, in the 70th verse of the 119th psalm, we find the words: "Their heart is as fat as *brawn*." The B. of Wiltshire is celebrated, and it is also a famous dish in Canterbury.

BRAXTON, a co. in West Virginia, 646 sq.m.; pop. '70, 6480; in 80, 9730. It is a hilly and wooded region, but well watered, and generally fertile. Co. seat, Sutton.

BRAXTON, CARTER, 1736–97; b. Virginia; one of the signers of the declaration of independence. He succeeded Peyton Randolph as a delegate in the Continental congress, and served in the state legislature.

BRAXY, BRAXES, BRAXIT, BRACKS. These words are given as synonymous in Jamieson's *Dictionary*, indicating a disease in sheep. In the dialect of Angus, it is called braik and bracks. The derivation of the word is uncertain. The vague way in which the term braxy is used, renders it difficult to define the disease, for in different parts of the country, totally different disorders are included under this head. Of the two most generally recognized as braxy, the one is an intestinal affection attended with obstinate diarrhea; the other is a blood disease, and the result of plethora or fullness of blood. The second, which is spoken of by the better informed shepherds as the true braxy, may best be described here.

Causes.—A very lean flock of sheep placed on rich food is very apt to be decimated by braxy. By rich food is meant more particularly those substances containing an abundance of nitrogenous principles, such as luxuriant heather, strong and succulent grass, the best turnips, etc. Hilly land is favorable to the production of braxy, from the firm nature and nutrient qualities of food growing on it. We find the disease in such situations in the winter season. About the month of November, many of the well-fed hogs placed on turnips die suddenly from braxy; and, again, when farmers resort to the forcing-system towards spring, the mortality is great, particularly when, in addition to much artificial food, sheep are allowed rich pasture. The mortality is greatest at the period of full moon, from the sheep grazing during the light nights as well as by day. The shepherd very frequently at these times finds one or two dead in the morning. Some assert that, in the winter, exposure induces braxy; and it is very possible that it may be produced by any sudden check to the exhalations, which tend so much to maintain the balance of the functions and purify the blood.

Symptoms.—The animal, in full health, suddenly ceases to eat, has a staring look, is peculiarly excitable, and separates itself from the flock. The head is lifted high, the breathing becomes labored, the countenance appears anxious, and the animal loses the power of its limbs. It totters, falls over, is seized with convulsions, and dies within five or six hours, and often within an hour from the first symptoms of the disease.

Cadaveric appearances.—If the sheep's throat is cut before it dies, the absence of any peculiar appearances within the body is very remarkable: the flesh appears of a dark-red color, and the veins are charged with dark blood, but, on the whole, the body of the sheep looks so well that the mountain-shepherd cuts it up to make "braxy mutton." If the sheep is allowed to die of itself, the body soon swells, putrefies, and is rendered useless.

Treatment.—The prevention of the disease alone affords hope, and it consists in regulating the animal's diet, to prevent sudden transitions from low to rich keep; to mix food so as to modify the action of the more highly nitrogenized kinds; and to check the development of plethora or fullness of blood by saline purgatives and diuretics, such as Epsom and Glauber salts or niter. The principles to be followed out in preventing this disease are precisely similar to those referred to under the head BLACK QUARTER in cattle. Shelter during severe winter weather is insisted on by shepherds as essential to prevent the malady.

Braxy mutton, above alluded to, is, as a general rule, not unwholesome; though in warm climates the same disease in sheep assumes a very malignant type, and indeed

constitutes one of the carbuncular diseases. Though the flesh can be eaten with impunity in the mountains of Scotland, it is most dangerous and condemned in southern Europe.

BRAY, a maritime t., situated partly in the co. of Dublin, partly in that of Wicklow, 13 m. s.e. from Dublin, with which city it is connected by the Dublin, Kingstown, and Bray railway, and the Dublin, Wicklow, and Wexford railway. The pop. in 1861 was 4182, and in 1871 had risen to 6087, of whom 4562 were Roman Catholics, 1315 Protestant Episcopalians, and the rest of other denominations. Some years since, B. was a small fishing-village; but the beauty of its situation has made it a popular watering-place, as well as a favorite position for villa residences; and under the enterprise of a few active speculators, it has not only grown in its dimensions, but the extensions have been carried out with excellent taste and spirit. The most striking buildings are the new hotels, and a Turkish bath, recently diverted to other purposes. The affairs of the municipality are administered by town commissioners. B. has a weekly newspaper.

BRAY, a parish in Berkshire, England, 25 m. w. of London. In this curacy a vicar in the 16th c. was a Roman Catholic with Henry VIII., a Protestant when the king changed his mind, again a Roman Catholic under Mary, and again a Protestant under Elizabeth; avowing his only religion to be to "live and die vicar of Bray."

BRAY, Mrs. Anna Eliza, an authoress, is daughter of the late John Kempe, Esq., of the New Kent Road, Surrey, and was b. towards the end of last century. At an early age she showed much of the imaginative faculty, and a taste for design, which latter brought her the acquaintance of the celebrated Mr. Stothard, R.A. From Stothard she took lessons in drawing; and in Feb., 1818, married his second son, Charles Alfred Stothard, also an artist, and author of a well-known work entitled *The Monumental Effigies of Great Britain, selected from our Cathedrals and Churches*, etc. In July, 1818, she accompanied her husband to France. Their tour and residence in France lasted until about the middle of Nov. in the same year; and Mrs. Stothard wrote an agreeable and lively account of her first foreign experiences, under the title of *Letters written during a Tour through Normandy, Brittany, and other parts of France, in* 1818, *with Numerous Engravings after Drawings by C. Stothard, F.S.A.* (Lond. 1820, 4to). Subsequently, Mrs. Stothard accompanied her husband on a similar tour in the Netherlands. In May, 1821, however, she had the severe misfortune to lose her husband, who was killed by falling from a ladder. In 1823, Mrs. Stothard wrote a life of her husband, entitled *Memoirs, including Journals, Letters, Papers, and Antiquarian Tracts of the late C. A. Stothard, with Connective Notices of his Life, and some Account of a Journey in the Netherlands.* Distress of mind brought on ill health, and Mrs. Stothard suffered from an affection of the eyes, which obliged her to give up literary labor altogether for more than two years. In 1825, she married the Rev. E. A. Bray, vicar of Tavistock; and in the following year published a historical romance entitled *De Foix*, which she had begun during her first husband's lifetime. The idea of this romance was conceived during the tour in Normandy; and similarly, that of her second romance, *The White Hoods*, during her tour in the Low Countries. This was published in 1828, and was followed by *The Protestant*, also in 1828; *Fitz of Fitz-Ford, a Legend of Devon* (1830); *The Talba, or Moor of Portugal* (1830); *Warleigh, or the Fatal Oak, a Legend of Devon* (1834); *Trelawny of Trelawne, or the Prophecy, a Legend of Cornwall* (1837); *Trials of the Heart* (1839); *Henry De Pomeroy* (1842); and *Courtenay of Walreddon, a Romance of the West* (1844). A collective edition of all these romances was published in ten volumes in 1845, with a "general preface," in which the writer mentions the circumstances under which each was produced. Mrs. B. is also author of *The Borders of the Tamar and the Tary* (1836); *The Mountains and Lakes of Switzerland* (1841); *Trials of Domestic Life* (3 vols., 1848); *Life of Thomas Stothard, R.A.* (1851); *A Peep at the Pixies* (1854), and *Händel, his Life, Personal and Professional, with Thoughts on Sacred Music* (1857). In July, 1857, Mrs. B.'s husband died; and in 1859, she published his *Poetical Remains.* In 1870 appeared *The Good St. Louis and his Times*, and *The Revolt of the Protestants of the Cevennes.* In 1871 came *Hartland Forest, a Legend of North Devon;* in 1873, *Joan of Arc, and the Times of Charles VII., King of France;* and in 1874, *Roseteague.*

BRAY, Sir Reginald, d. 1503; an English architect, a favorite of Henry VII. He built the chapel of that king in Westminster abbey, and decorated St. George's chapel at Windsor.

BRAY, Thomas, D.D., 1656–1730; educated at Oxford, and rector of Sheldon. He was sent to America to regulate the affairs of the church just established in the colony of Maryland, and afterwards took much interest in foreign missions, in aid of which he published *Bibliotheca Parochialis*, and a discourse on *Apostolical Charity.* He was also the author of *Catechetical Lectures; Martyrology, or Papal Usurpation*; *Directorium Missionarium*, and some other works.

BRAYERA. See Cusso.